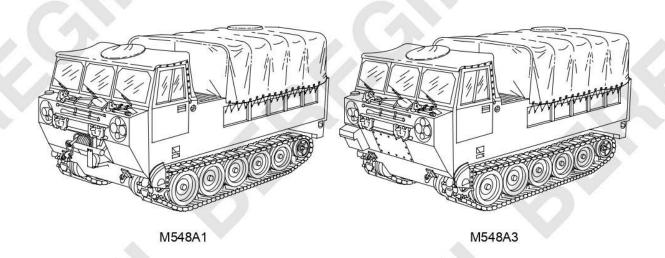
TECHNICAL MANUAL

UNIT MAINTENANCE MANUAL

FOR CARRIER, CARGO TRACKED, 6-TON M548A1 2350-01-096-9356 (EIC: AEU)

M548A3 2350-01-369-6081 (EIC: AE9)



SUPERSEDURE NOTICE — This manual supersedes TM 9-2350-247-20-1 dated August 1994, including all changes.

DISTRIBUTION STATEMENT A — Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY 30 June 2001



WARNING SUMMARY

WARNING SUMMARY

This list summarizes critical WARNINGS in this manual. They are repeated here to let you know how important they are. Study these WARNINGS carefully; they can save your life and the lives of personnel with whom you work.





Energized system and equipment can burn you. If MASTER POWER SWITCH is ON, electrical system and equipment will be energized. Make sure MASTER POWER SWITCH is OFF when you work on electrical systems or equipment.





Failure to set the parking brake and block the road wheels can allow the carrier to move and could result in injury or death. Always set the parking brake and block road wheels before working on the carrier.

WARNING



Battery post and cables touched by metal objects can short circuit and burn you. Gas from batteries can explode and injure you. Battery acid can blind you or burn you.

- Do not wear jewelry when you work on electrical systems.
- Use caution when you work near battery or electrical system with tools or other metal objects.
- Do not get acid on your skin or in your eyes.
- Do not allow sparks near batteries.

TM 9-2050y247u20-dom

WARNING SUMMARY (cont)

WARNING



Heater and engine exhaust can kill or poison you. Close power plant access panel tight before you start engine. Do not run heater or engine indoors without very good fresh air flow. Keep power plant access cover closed when you run engine. Check for the smell of exhaust fumes. If you notice any fumes, open hatches and turn on vent fans.

WARNING



Exhaust gases can make you ill or kill you. Signs of exhaust gas poison are dizziness, headache, loss of muscle control, sleepiness, coma, or death. If anyone shows signs of exhaust gas poisoning:

- (1) Get all personnel out of carrier.
- (2) Get medical help.
- (3) Make sure personnel have lots of fresh air.
- (4) Keep personnel warm.
- (5) Do not let anyone do hard exercise.

If anyone stops breathing, give artificial respiration.

WARNING



Air pressure in excess of 30 psi (207 kpa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

WARNING



If you work on a carrier that has been running, you could be burned. All tasks begin with a cooled down carrier. Allow carrier to cool, or use care if you work on a hot carrier.

WARNING SUMMARY (cont)

WARNING



Unsafe use of chemical products can injure you. Read and follow warnings and instructions on labels of all chemical products. Follow all general shop safety procedures. See supervisor for further instructions on safety.

WARNING



Portable and fixed fire extinguisher cylinders are under pressure and can discharge and injury you. Handle cylinders with care.

WARNING



Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands away from pinch points. Keep hands out of engine compartment while power unit is being removed or installed.

WARNING



Starting engine right after a fire could restart the fire and kill or injure you. Do not turn MASTER SWITCH ON until cause of fire has been repaired or removed.

TM 9-2050y247u20.dom

WARNING SUMMARY (cont)

WARNING



Loctite sealing compound can damage your eyes. Before you handle loctite sealing compound, wear safety glasses/goggles and avoid contact with eyes. If it gets into your eyes, flush eyes with fresh water and get medical help.

WARNING



Loose clothing is dangerous around moving belts and pulleys. You could get badly hurt if your clothes get caught in moving parts.

WARNING



Hot radiator coolant can burn you. Use hand to remove cap ONLY if cool to touch. Turn cap slowly to release pressure. Replace cap by pressing down and turning until tight.

WARNING



Radiator is heavy and can cause back injury if handled improperly. Be sure to use a hoist and helper to remove radiator.

WARNING SUMMARY (cont)





Do not work under power plant. Power plant is heavy and may cause personnel and equipment damage if it falls. Lower power plant close to the ground before starting task.

WARNING



Carbon Monoxide is poisonous and can kill you. Play it safe. Make sure power plant access covers and door are closed tight before you start engine. Do not idle engine with driver's power plant access panel off unless there is very good air flow.

WARNING



Damaged lifting slings can fail with load. Soldiers can be killed or injured. Inspect all slings before use. Do not use damaged slings.

WARNING



Do not touch exhaust pipes with bare hands. You could get a bad burn.

TM 9-2050y247u20-dom

WARNING SUMMARY (cont)

WARNING



Gas from batteries can explode. Ventilate compartment before you disconnect of connect battery cables. Battery acid can burn or blind you. Do not get acid on your skin or eyes. ALWAYS disconnect battery negative leads first and connect them last.

WARNING



Lifting or moving objects in excess of 70 lb (32 kg) could injury you. Make sure to get an assistant or use a lifting device to move any heavy objects.

WARNING



Chemical agent resistant coating (CARC) paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose, and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. The following precautions must be taken whenever using CARC paint:

- ALWAYS use air line respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards.
- DO NOT let skin or eyes come in contact with CARC paint. Always wear protective equipment (gloves, ventilation mask, safety goggles, etc.)
- DO NOT use CARC paint without adequate ventilation.
- NEVER weld or cut CARC-coated materials.
- DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use.
- BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial
 exposure. Seek medical help immediately if symptoms are detected.

WARNING SUMMARY (cont)





Mixing of CARC paint must be done in a well-ventilated mixing room or spraying area away from open flame with personnel wearing eye protection. Paint is flammable and can cause injury or death to personnel.

WARNING



Protective equipment (gloves, goggles, ventilation mask) must be worn when using CARC paint. DO NOT leave any skin exposed. Contact with CARC paint can cause skin burns.

WARNING



High-efficiency air purifying respirators should be used when grinding or sanding CARC-coated equipment. Failure to do so may result in injury or death to personnel.

WARNING



Carrier operation during hot weather may result in potential heat stress to crew members. Crew members should limit their exposure based on TB med 507 using PHEL Chart (WP 0542 00) curve as a guide.

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WARNING SUMMARY (cont)

WARNING



Start up of equipment or moving parts could injure you or others. If other personnel are working on your carrier, be sure you know what they are doing. Place DO NOT OPERATE tags on MASTER SWITCH when needed to prevent startup.

WARNING



Unsafe use of tools and equipment can injure you. Read and follow warnings and instructions on labels of all tools and equipment. Follow all general shop safety procedures. See unit commander for further instructions on safety.

WARNING



Heat shield insulation may contain asbestos. Inhaled asbestos dust can cause permanent lung damage. Wear a filter mask approved for asbestos protection and rubber gloves during handling of asbestos. Wash skin and clothing with soap and water after handling asbestos. Dispose of asbestos material in accordance with approved hazardous waste disposal procedures.

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WARNING SUMMARY (cont)



HIGH VOLTAGE is used in the operation of this equipment.

DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NEVER work on equipment unless at least one person familiar with the operation and hazards of the equipment is nearby. That person should also be competent in giving first aid. When an operator assists a technician, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. When working inside equipment with power off, take special care to ground every capacitor likely to hold a dangerous potential.

BE CAREFUL not to contact high-voltage connections when installing or operating this equipment.

KEEP one hand away from the equipment to reduce the hazard of current flowing through life-sustaining organs of the body.



Magnesium may catch on fire and burn you if welded on or if exposed to high temperatures. Do not weld on magnesium casings or expose them to high temperature. Be careful when filing or grinding magnesium. Use grinding equipment marked FOR MAGNESIUM ONLY. Keep a Class D fire extinguisher of a sodium chloride base dry powder to fight magnesium fires. Water and foam-type fire extinguisher will cause magnesium fires to flare up and create toxic fumes which can result is death.



Do not weld on plastic molding material (foam filled) parts. Welding on plastic molding material (foam filled) parts creates toxic fumes. Fumes are hazardous to your health and can result in death.

TM 9-2050y247u20.dom

WARNING SUMMARY (cont)

WARNING



Do not wear jewelry. It can get caught and cause electrical burns or may cause electrocution.





Steam can splash back and burn you. Direct steam splash back away from you and others. Always wear full eye protection.

WARNING



NBC agents can kill you. Do not service air cleaner or vent system after NBC attack until carrier has been decontaminated and filters disposed of by NBC team. Unit commander or officer in charge must assign NBC team to decontaminate system and dispose of filters. Unit commander of officer in charge must prescribe necessary protective clothing and safety measures for NBC team.

WARNING



M548A3 requires both battery negative leads disconnected before maintenance. Each side provides power that may kill or injure personnel if both negative leads are not completely disconnected.

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WARNING SUMMARY (cont)





Failure to lock right and left steering levers (M548A1) or apply parking brake (M548A3) and block the road wheels can allow the carrier to move and could result in injury or death. Always lock right and left steering levers (M548A1) or apply parking brake (M548A3) and block road wheels before working on the carrier.

WARNING



If road wheel lifters slips while lowering road arm, it could injure you. Stand clear before you lower or raise road arm.

WARNING



Do not handle wire rope with bare hands. Broken wires can rip your hands open. Wear leather gloves when handling wire rope.



CHANGE NO. 1 HEADQUARTERS DEPARTMENT OF THE ARMY WASHINGTON, D.C., 26 AUGUST 2005

TECHNICAL MANUAL UNIT MAINTENANCE MANUAL

FOR

CARRIER, CARGO TRACKED, 6-TON M548A1 2350-01-096-9356 (EIC: AEU)

CARRIER, CARGO TRACKED, 6-TON M548A3 2350-01-369-6081 (EIC: AE9)

DISTRIBUTION STATEMENT A – Approved for public release; distribution is unlimited.

TM 9-2350-247-20-1, 30 June 2001 is updated as follows:

- 1. File this change sheet in front of the publication for reference purposes.
- 2. New or updated text is indicated by a vertical bar in the outer margin of the page.
- 3. Revised illustrations are indicated by a miniature pointing hand adjacent to the updated area.
- 4. Remove old pages/Work Packages and insert new pages/Work Packages as indicated below.

Remove Pages/Work Packages

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i – xvii/xviii blank
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WP 0085 00
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Index-1 – Index-47/48 blank
None
DA Form 2028 (3)
Metric Chart/Back Cover
Front Cover

Insert Pages/Work Packages

AB blank
i xvii/kviii blank
WP 0001 00 - 0003 00
WP 0085 00
WP 0127 00 - 0128 00
Index-1 - Index-53/54 blank
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LIST OF EFFECTIVE PAGES/WORK PACKAGES

Note: Updates to all portions of this TM are indicated by a vertical bar in the outer margin of the page.

Dates of issue for original and updated pages/work packages are:

Original 0 (30 June 2001) Change 1 (26 August 2005)

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^{*}Zero in this column indicates an original page



HEADQUARTERS DEPARTMENT OF THE ARMY WASHINGTON, D.C., 30 June 2001

TECHNICAL MANUAL UNIT MAINTENANCE MANUAL

CARRIER, CARGO TRACKED, 6-TON M548A1 2350-01-096-9356 (EIC: AEU)

> M548A3 2350-01-369-6081 (EIC: AE9)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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CURRENT AS OF 5 JANUARY 2004

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REPLACE NBC CIRCUIT BREAKER AND RELAY (M548A3)	0530 00
REPLACE NBC WIRING HARNESS FROM BATTERY COMPARTMENT TO MANIFOLD (M548A3)	
REPLACE NBC M3 HEATER AND ADAPTER (M548A3)	
REPAIR NBC MANIFOLD (M548A3)	
REMOVE/INSTALL NBC M1A1-19 PRECLEANER ASSEMBLY AND FRAME	
(M548A3)REPLACE NBC M1A1-19 PARTICULATE FILTER UNIT (M548A3)	
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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

This manual tells you how to perform unit maintenance for the M548A1 and M548A3 carriers.

Before starting a task or procedure, read HOW TO USE THIS MANUAL and the General Maintenance Procedures Work Package.

USE YOUR MANUAL ON THE JOB

The best way to learn about this manual is to practice using it. Knowing how to use this manual will save both time and energy.

HOW TO USE THE WORK PACKAGES (WP)

How to find the Work Package you need

Pick a key word from the vehicle part or system to be used. Look in the INDEX for this key word or the name of the action you will perform. Turn to the Work Package and page indicated.

The INDEX lists each Work Package under one or more headings. For example, the WP titled REPLACE TOWING PINTLE could be found under the two headings "Pintle", and "Towing".

How to read the Work Package

Pay attention to all warnings, cautions and notes. These can appear in all types of procedures. They help you avoid harm to yourself, other personnel, and equipment. They also tell you things you should know about the procedure.

Before you start a procedure, get all the tools, supplies, and personnel you need to do the procedure. These items will be listed in the INITIAL SETUP of the Work Package.

Start with step 1 and do each step in the order given. Numbered primary steps tell you WHAT to do. Alpha substeps tell you HOW to do it.

Look at the illustrations. Locators show you where the equipment and parts are located on the vehicle. Closeup illustrations show the details you need to do the procedure.

Maintenance Procedures Work Packages

Maintenance Procedures Work Packages keep the carrier in shape to operate. Maintenance Procedures are used to present maintenance instructions. Each maintenance procedure details steps which you need to perform. If the vehicle and parts need maintenance that is not included in any procedure in the manual, notify your supervisor.

Read the INITIAL SETUP section carefully before you start any procedure. Get the tools and supplies listed and the personnel needed. Be sure the equipment is in the condition required.

Read all of the Work Package before starting. Follow the steps in the order given.

FOLLOW-THROUGH STEPS tell you what to do after the maintenance task is done. The words END OF TASK will tell you when you have finished the procedure.

Troubleshooting Work Packages

Troubleshooting Work Packages help you locate faulty parts. They direct you to the maintenance procedure to correct these faults. Chapter 2. Troubleshooting, contains detailed information on how to perform troubleshooting procedures. Read HOW TO USE TROUBLESHOOTING Work Package (WP 0005 00) before performing the troubleshooting procedures in the chapter.

Preventive Maintenance Checks and Services (PMCS) Work Package

Preventive maintenance is required to keep your carrier in good running condition. The PMCS procedures for unit maintenance are performed on a periodic basis.

TM 9-2350y247u20-dom

HOW TO USE THIS MANUAL (cont)

If anything seems wrong with the carrier systems and you cannot fix it yourself, notify unit maintenance. Common things to watch for are loose bolts or damaged welds. Watch for worn insulation, loose clamps, and loose connectors when checking wiring harnesses.

DEFINITION OF WORK PACKAGE TERMS

Warnings, Cautions, And Notes

Pay attention to all warnings and cautions within the WP. Ignoring a warning could cause death or injury to yourself or other personnel. Ignoring a caution could cause damage to equipment. Notes contain facts to make the procedure easier. Warnings, cautions, and notes always appear just above the step to which they apply.

WARNINGS Call attention to things that could kill or injure personnel. Warnings are also listed

in the Warning Summary section (page a).

CAUTIONS Call attention to actions or materials that could damage equipment.

NOTES Contain important facts to make the procedure easier.

Helper

Helpers are needed in procedures that require more than one person. A helper may be needed to help lift objects or act as an outside observer.

If a helper is needed to perform a procedure, the INITIAL SETUP will list "Helper (H)" under the PERSONNEL REQUIRED heading.

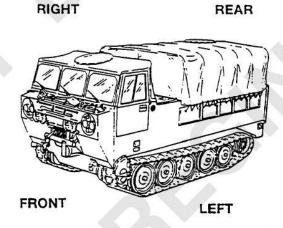
If a helper assists with a step or substep, the step or substep will include: "Have helper assist".

If a helper performs the action alone, the step will start with "(H):".

Locational Terms

The terms FRONT, REAR, LEFT, and RIGHT are used to indicate where items are located on the vehicle. The point of reference for these terms is different for *Carrier* items and *Power Unit* items. (Carrier items are items which are not on the power unit. Power unit items are items on the engine, transmission, differential, or transfer gearcase.)

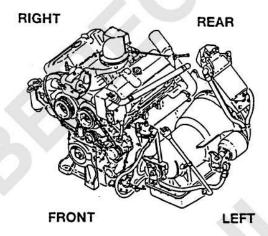
If you are working with carrier items, use this point of reference. Think of the location as if you were sitting in the driver's seat looking forward.



M548A1 SHOWN

HOW TO USE THIS MANUAL (cont)

If you are working with power unit items, use this point of reference. Think of the location as if you were standing at the transfer gearcase end of the power unit and facing the flywheel. This rule applies whether the power unit is IN or OUT of the carrier.



M548A1 SHOWN

REFERENCES

References within a procedure refer to a different manual or to another procedure in the same manual. They are found in the INITIAL SETUP and in the FOLLOW-THROUGH steps. For example.

MASTER SWITCH OFF (see your -10)

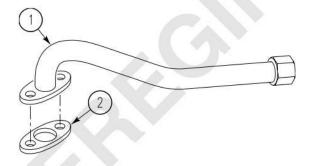
Battery ground lead disconnected (WP 0310 00, WP 0311 00, or WP 0312 00)

For all procedures, the following comments apply:

- Parts which are discarded when removed will be referred to as "new" in the procedure step when installed. Examples
 are: gaskets, lockwashers, some preformed packings, and some retaining rings.
- These and other new parts are listed under MATERIALS/PARTS in the INITIAL SETUP.

GENERAL MAINTENANCE

Cleaning, inspecting, checking for leaks, and similar procedures which apply to most procedures are found in the GENERAL MAINTENANCE PROCEDURES section of the PMCS (WP 0128 00). Use these steps to clean and inspect any part being removed, repaired, or installed. Special cleaning will be covered in the procedure step. Below is a step that would require general cleaning.



5. Remove gasket (1) from upper tube flange (2). Discard gasket.

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HOW TO USE THIS MANUAL (cont)

After performing this step, you would clean the mating surface with cleaning compound and a wiping rag according to the general cleaning procedures. In other procedures, hoses or rubber hatch seals will need to be checked for leaks. Refer to Chapter 3 for general procedures.

HOW TO USE THE REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) WITH THIS MANUAL

The RPSTL (TM 9-2350-247-24P) gives the National Stock Number (NSN) required to order parts used in the maintenance procedure. To use the RPSTL to identify and order a part, do the following:

- 1. In this manual, turn to the first page of the procedure to be performed.
- 2. Find Materials/Parts under INITIAL SETUP and read the part(s) that need replacement. If required, find the illustrated part in the procedure steps.
- 3. Go to the RPSTL and find the same illustrated part. That part will have an item number assigned to it. Look this item number up in the listing for that figure. Use the figure and item number index to find the NSN.
- 4. If you inspect an item and find that it is damaged, go to the RPSTL and find the SMR code for the item. If the SMR code does not authorize you to repair the item, reassemble it and send it to the authorized level of maintenance.
- 5. The usable on code in the RPSTL appears in the lower left comer of the Description column heading. Usable on codes are shown as 'UOC......' in the Description column (justified left) on the first line following the item description/nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes in the RPSTL are:

Table 1. RPSTL Usable Codes

Code	Used On
V96	M548A1 Carrier, Cargo, tracked
AP4	M548A3 Carrier, Cargo, Tracked

Military Manuals Com-20-1

CHAPTER 1

UNIT INTRODUCTORY INFORMATION WITH THEORY OF OPERATION

WORK PACKAGE INDEX	
Title	Sequence No
GENERAL INFORMATION	0001 00
EQUIPMENT DESCRIPTION	0002 00
THEORY OF OPERATION	0003 00
REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT	



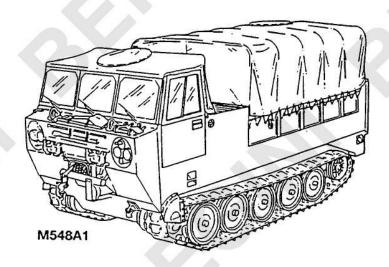
GENERAL INFORMATION

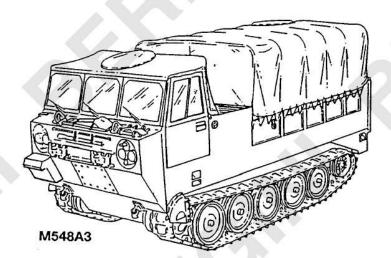
0001 00

SCOPE

Type of Manual: Unit Maintenance

Model Number and Equipment Name: M548A1/M548A3 - Carrier, Cargo Tracked, 6-Ton **Purpose of Equipment:** Transportation and positioning combat troops and supplies.





The terms left and right as used in this manual are defined as standing at the rear and looking toward the front of the carrier.

GENERAL INFORMATION — Continued

0001 00

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS). Forms needed by units maintaining this material are listed in the References work package (WP 0539 00).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your M548A1 or M548A3 carrier needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-TR-QCL, Warren, MI 48090. We will send you a reply.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

See the following technical manuals for information on destruction of Army materiel:

TM 43-0002-33 Destruction of Conventional Ammunition and Improved Conventional Munitions (ICM) to Prevent Enemy Use.

TM 750-244-2 Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.

TM 750-244-6 Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use.

TM 750-244-7 Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1055, 1090, and 1095 to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

See ATPD 2228 for information about administrative storage or shipment of the M548A1 and M548A3 and their components.

NOMENCLATURE CROSS-REFERENCE

This listing includes nomenclature cross references used in this manual.

Adapter Nipple, pipe, union

Air vent, personnel Register, metal: personnel air vent

Assembly Adapter assembly Bilge pump Rotary pump Breather Air filter intake Bulb Incandescent lamp Antifreeze and water Coolant Coolant gauge Temp indicator Detector Liquid transmitter Dipstick Liquid level gauge rod

Drain plug Pipe plug

Engine oil filter Fluid pressure filter
Engine oil gauge Dial pressure gauge
Exhaust collector Exhaust connection

Fastener Toggle pin

Fire bottle Compression gas cylinder

Fluid level detector Liquid transmitter
Fuel control cable Fuel filter Fluid filter

Fuel gauge Liquid quantity gauge

GENERAL INFORMATION — Continued

0001 00

Fuel tank

Gear box

Mechanical housing

Grease fitting

Lubrication fitting

Hand brake

Parking brake lever

Hinge pin

Headless straight pin

Horn switch buttonPush switchHubSupport

Indicator light Indicator lamp Inlet grille Intake grille Jack Receptacle Jam nut Hexagonal nut Key washer Locking plates Link Plain rod bearing Lock nut Self-locking nut Lock screw Self-locking bolt Lock washer Self-locking washer Lock wire Non-electrical wire **Lubrication pump** Hydraulic pump

NBC Nuclear, biological, and chemical

Plug Connector

Propeller shaft Flexible drive shaft Quick disconnect Quick coupling shaft Radio Receiver-transmitter Road wheel Solid rubber wheel Road wheel arm Support assembly Rod Connecting link Screen Metal grille Screw Machine bolt

Seat belt Vehicular safety belt

Shim Spacer

Shim pack Spacer assortment

Slave cable Adapter cable assembly

Splined shaft Output carrier
Starter switch Interlock switch

Stop light Taillight

Stowage box Vehicular accessory box

GENERAL INFORMATION — Continued

0001 00

Switch Circuit breaker

Throttle control cable Throttle control

Tie strap Electric tiedown strap

Towing pintle Pintle hook latch

Turn signal assembly Vehicle directional light
Universal joint Universal joint spider

LIST OF ABBREVIATIONS / ACRONYMS

Many abbreviations are used in this manual. They are listed below. Learn what each one means. It will make your job easier.

A After
B Before
BATT Battery
BO Blackout
BRT Bright

COEIL Components of end items list
CVC Combat Vehicle Communications

D During ENG Engine

FOV Field-of-view
GEN Generator

HI TEMP High Temperature

Intercom

Intercommunication

IR Infrared

NBC Nuclear, biological and chemical

N2 Nitrogen gas

OVE On Vehicle Equipment

PMCS Preventive Maintenance Checks and Services

PRESS Pressure
TEMP Temperature
TRANS Transmission
Vent Ventilation
W Weekly

SAFETY, CARE, AND HANDLING

Read warnings in the Warning Summary at the front of this manual..

EQUIPMENT DESCRIPTION

0002 00

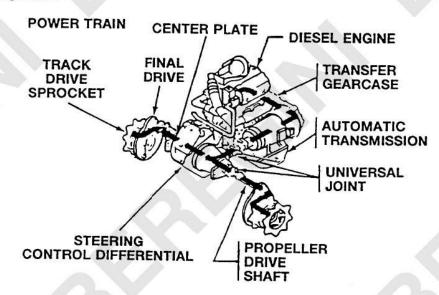
CAPABILITIES AND FEATURES

For equipment characteristics, capabilities, and features, see your -10.

LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS

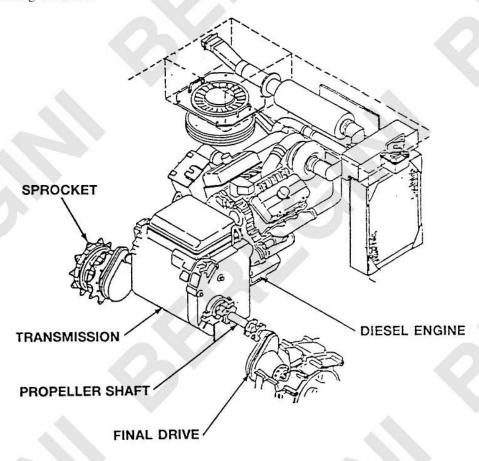
M548A1

The major components of the M548A1 carrier are connected together to form the power train. The diesel engine, transfer gearcase, and automatic transmission form the power plant. The steering control differential, final drives, drive shafts, and universal joints complete the power train. A propeller drive shaft couples the steering control differential to the transmission. Power from the two differential output propeller drive shafts is transferred to the left and right final drives. The final drives turn the track drive sprockets.



M548A3

The major components of the M548A3 carrier are connected together to form the power train. The power train furnishes and controls the power to drive and steer the carrier. A V6 diesel engine, transmission, connecting propeller shafts and left and right final drives make up the power train. The power plant consists of the diesel engine and automatic transmission. Power developed by the engine is transmitted to the transmission which delivers power through the final drives to the sprockets of the suspension system. The engine and transmission control the speed of power from one side to the other, providing the method of steering the carrier.



LOCATION OF COMPONENTS — LEFT FRONT VIEW

NOTE

Lifting eye may be removed if 50 caliber machine gun mount is installed. Cab cover may not be there if M2 machine gun is mounted.

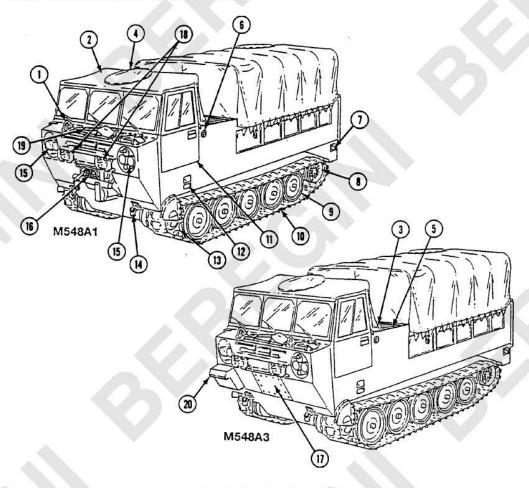


Table 1. Left Front View

1. Lifting eye	11. Cab door	
2. Cab cover	12. Cab step	
3. Radiator filler cab (M548A3)	13. Drive sprocket	
4. Cab hatch cover	14. Towing hooks	
5. Air intake grille (M548A3)	15. Lights	
6. Fire extinguisher outside handle	16. Winch (M548A1)	
7. Fuel filler cap	17. Vehicle compartment heater (M548A3)	
8. Idler wheel	18. Spare track shoe	
9. Road wheel	19. Pioneer tools	
10. Track	20. Decontamination guard (M548A3)	

LOCATION OF COMPONENTS — RIGHT REAR VIEW

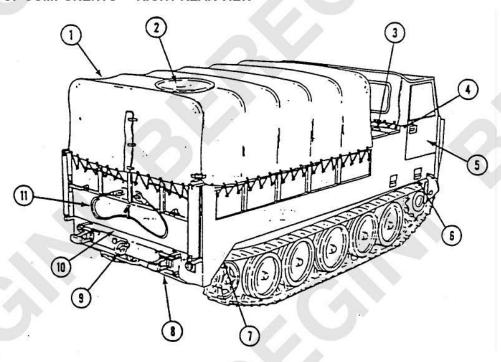


Table 2. Right Rear View

Cargo compartment cover	7. Track cover
Cargo compartment hatch cover	8. Tailgate
3. Radiator filler cap (M548A1)	9. Towing pintle
4. Front bilge pump outlet (hole in hull)	10. Cargo compartment door
5. Cab door	11. Towing cable
6. Cab step	

DIFFERENCES BETWEEN CARRIERS

This manual covers two different carriers. The major differences can be determined from the chart below.

Table 3. Differences Between Carriers

Carrier function	M548A1	M548A3
Personnel/Cargo	X	X
Winch	X	
Vehicle compartment heater installation		X
Special purpose kits:		
Air brake kit	X	
Caliber .50 machine gun mount kit	X	X
Engine heater coolant kit	X	X
Material handling kit	X	X
M66 ring mount kit	X	X
Vehicle compartment heater kit		
Cab (primary)	X	
Cab (secondary)	X	X
Cargo area (primary)	X	X
Cargo area (secondary)	X	X
7.62 mm machine gun mount kit	X	X
Tum signal kit	X	X

EQUIPMENT DATA

The following table lists data you may need to perform unit maintenance on M548A1 and M548A3. Other data necessary to operate and service your carrier is listed in -10, PMCS, and RPSTL.

Table 4. Equipment Data

Engine (M548A1)	Characteristics	Metric Equivalents
Manufacturer	Detroit Diesel Engine Corporation	
Model	5063-5299	
Series	6V53	
Туре	two-cycle diesel compression-ignition	
Number of cylinders	6	
Bore	3.875 in	10 cm
Stroke	4.5 in	11 cm
Piston displacement	3.18 cu/in	5.2 liters
Compression ratio	21:1	

0002 00-5

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Change 1

Injectors	M50

Crankshaft rotation (viewed clockwise

at pulley)

510 psi 3516 kPa

Compression pressure (minimum) speed 600 rpm,

injectors removed

1L-3R-3L-2R-2L-1R Firing order

Cylinder numbering left bank (front-to-rear)

1L-2L-3L

Cylinder numbering right

bank (front-to-rear)

1R-2R-3R

Idle speed 650 to 700 rpm Governed speed (no load)

with quick disconnect

engaged

2925 to 2975 rpm

Horsepower 210 at 2800 rpm

Lubrication (type) forced feed

Lubrication pressure (normal at 2800 rpm) 40-60 psi

276 to 414 kPa

Lubricating pump type rotary

Stall speed 1900 to 2100 rpm

Valves overhead, rocker arm

1345 lb Dry weight 611 kg

Engine (M548A3) Characteristics Metric Equivalents

Detroit Diesel Engine Manufacturer

Corporation

Model 5063-5292 Series 6V53T

two-cycle diesel Type

compression-ignition

Number of cylinders

Idle speed 650-700 rpm 275 at 2800 rpm Horsepower No-load governor speed 2,925-2,975 rpm

Crankshaft rotation (viewed

at pulley)

clockwise

Cylinder numbering left

1R-2R-3R

bank (front-to-rear)

Cylinder nun	nbering right

bank (front-to-rear)

1L, 2L, 3L

1L, 3R, 3L, 2R, 2L, 1R Firing order

Cooling System (M548A1)	Characteristics	Metric Equivalents
Capacity	9.5 gal	36 liters
Thermostat (closed)	161-169°F	72-76°C
Thermostat (open)	161-189°F	72-87°C
Normal operating temperature (engine)	160-230°F	71-110°C
Radiator cap (auxiliary tank) pressure rating	13-18 psi	90-124 kPa

Cooling System (M548A3)	Characteristics	Metric Equivalents
Capacity	58 quarts (14.4 gallons)	55 liters
Refill	(approx) 9.5 gallons	36 liters
Thermostat range (bypass type)	162-167° to 180-185°F	72-75° to 82-85°C

Transfer Gearcase (M548A1)	Characteristics	Metric Equivalents
Туре	four helical gears w/power takeoffs	
Transfer ratio	1:1.286	
Dry weight	118 lb	54 kg

Transmission (M548A1)	Characteristics	Metric Equivalents
Manufacturer	Allison Division GMC	
Model	TX 100-1	
Туре	Straight through, torque converter, planetary gear, automatic	
Drive ranges	reverse, neutral, 2-3, 1-3, 1-2, 1	
Dry weight	309 lb	140 kg

Transmission (M548A3)	Characteristics	Metric Equivalents

Manufacturer Allison Transmission

Division, GMC

Model X-200-4/4A

Type Hydromechanical cross

drive

Rating

Input horsepower (max) 275

Input speed 2975 rpm

Gross vehicle weight 31,000 lb at 40 mph 1407 kg at 64.4 kph

Hydraulic torque converter

Type Single stage, three element,

polyphase

Stall torque ratio 3.32:1

Lockup clutch Automatic second through

fourth range

Gearing type Constant mesh, spur type,

planetary

Ranges Four forward, one reverse

Ratios

First 4.16:1
Second 2.34:1
Third 1.46:1
Fourth 1.04:1
Reverse 6.62:1

Steering Type Infinitely variable

hydrostatically controlled

differential

Range Minimum Steer Ratio

 First
 2.31:1

 Second
 1.58:1

 Third
 1.32:1

 Fourth
 1.22:1

 Neutral
 Pivot

Brakes

Type Multiple wet plate

Service apply Hydraulic with mechanical

actuation

Parking/emergency apply Mechanical back-up service

brakes

Deceleration Rate 16 ft/sec/sec 5 m/sec/sec

Oil System

45 liters Capacity 12 gallons

Sump Integral

Filter Integral, two stage with

> differential pressure warning switch and automatic bypass

Weight (dry) 975 lb 443 kg with container Approximately 1500 lb 681 kg

Steering Control Characteristics **Metric Equivalents** (M548A1)

Model DS200 Suspension 3-point

Rating

Input (maximum) 4675 lb-ft 6339 N·m

Input (maximum) 3825 rpm Net input (maximum) 215 hp

Rotation

Input shaft (in forward clockwise

range)

Left output shaft (in forward clockwise

range)

Right output shaft (in

forward range)

counterclockwise

Steering control (internal) mechanical brakes

Bevel gear ratio 1.28:1

> Suspension Characteristics Metric Equivalents

5 each side Torsion bars Shock absorbers, hydraulic,

direct action

3 each side

Road arm bumpers 3 each side

Idler wheels 1 each side 1 each side Sprocket wheels

Idler assemblies 1 each side

Road wheels:

Type Aluminum disk with solid

rubber tires (steel discs

optional)

Quantity 20 (10 duals)

Size 24 in dia x 2 1/8 in wide 61 cm dia x 5 cm wide

Support assembly, road

wheel

5 each side

Track, flat, single pin, (removable rubber pads)

Model T130 5 1/4 in 13 cm

T130E1 4 3/4 in 12 cm

Track, flat, dual pin, hinged (removable rubber pads)

Model T150F 33 cm width (13 in) 15 cm pitch (6 in)

Tread (centerline to

centerline of tracks)

85 in

38 cm

Number of shoes (new) 66 each side

Width 15 in 38 cm
Tension (between track and 3/8-5/8 in 10-16 mm

2nd road wheel)

Electrical System Characteristics Metric Equivalents

Batteries

Type MS52149-1

(6140-01-210-1964)

Voltage (M548A1) 24 Vdc (two 12-volt in

series)

Voltage (M548A3) 24 Vdc (four 12-volt in

series/parallel)

Generator (M548A1) 100

amp

Manufacturer Leece Neville

(2920-00-782-1955)

Model 2184A

Generator 200 AMP

(M548A3)

Manufacturer Leece Neville

(2920-01-238-9710)

Model	A0012266AA	
Manufacturer	C.E. Niehoff and Co. (2920-01-292-2993)	
Model	N1206	
Manufacturer	Prestolite Electric (2920-01-292-2994)	
Model	AMZ-4001	
Starter		
Manufacturer	Delco Remy Division GMC	
Model	16764-11663416 (MS53011-4)	
Optional manufacturer	Prestolite	
Model	11668641 (MS50311-4)	
Optional manufacturer	Leece Neville	
Model	12253404 (MS53011-4)	
Type	4-pole, 24 Vdc	
Brushes	8	
Rotation (viewed from drive end)	clockwise	
Type of engagement	shift lever solenoid plunger	
Internal wiring	series	
Engine low oil pressure switch (transmitter) breaks contact at	9-13 psi	62-90 kPa
Differential high oil temperature switch (transmitter) (M548A1) closes at	305°F + 5°	152°C
Transmission high oil temperature switch (transmitter) closes at	305°F + 5°	152°C

Winch (M548A1)	Characteristics	Metric Equivalents
Weight		
Complete	444 lb	202 kg
Less wire rope	313 lb	142 kg
Winch Transfer Gearcase		
Manufacturer	FMC	
Weight	21 1/2 lb	9.8 kg
Complete Less wire rope Winch Transfer Gearcase Manufacturer	313 lb FMC	142 kg

Vehicle Compartment Heater Kit (Primary)	Characteristics	Metric Equivalents
Heater (South Wind)		
Manufacturer	Stewart-Warner	
Model	8460C24	
Part number	7748716	
Operating voltage	20.0-28.5 Vdc	
Current consumption above 30°F (1°C)		
Start	16.5 amp	
Run	10.0 amp	
Current consumption below 30°F (1°C)		
Start	20.0 amp	
Run	13.5 amp	
Heat output		
High heat	60,000 Btu	63,300 J
Low heat	30,000 Btu	31,650 J
Fuel pressure requirement	3-15 psi	21-103 kN/sq cm
Overheat switch setting (maximum)	475°F	246°C
Height	24 1/8 in	61 cm
Diameter (nominal)	8 in	20.3 cm
Width (maximum)	13 in	33 cm
Weight	32.75 lb	14.9 kg
Heater (Perfection)		
Manufacturer	Нирр	
Model	MF510A	
Part number	11601809	
Operating voltage	20-28.5 Vdc	
Current consumption above 30°F (1°C)		
Start	15 amp	
Run	9.5 amp	
Current consumption below 30°F (1°C)		

5	Start	19.5 amp	
]	Run	17 amp	
	Heat output		
j	High heat	60,000 Btu	63,300 ј
I	Low heat	30,000 Btu	31,650 ј
Ι	Fuel pressure requirement	3-15 psi	21.0-103.0 kN/sq cm
	Overheat switch setting (maximum)	475°F	246°C
I	Height	24 1/8 in	61 cm
	Diameter (nominal)	8 in	20.3 cm
Ì	Width (maximum)	13 in	33 cm
1	Weight	31 lb	14 kg
J	Fuel pump		
]	Part number	MS5132-2 (96906)	
(Output pressure	3-6 psi	21.0-41.0 kN/sq cm
(Control box		
]	Part number	7748721 (19207)	
	Part number (optional control box)	10947220 (19207)	
]	Fuel		
1	Usable fuel	Any hydrocarbon fuel at temperature down to cloud point except DFA down to -65°F	-54°C

Engine Coolant Heater Kit	Characteristics	Metric Equivalents
Manufacturer	Stewart-Warner	
Model	939-J24	
Part number	11601698	
Heat output (surrounding air temperature)	70°F	21°C
Coolant		
High heat	15,000 Btu/hr	4.4 kw hr
Low heat	8,000 Btu/hr	2.3 kw hr
Exhaust		
High heat	8,000 Btu/hr	2.3 kw hr
Low heat	4,500 Btu/hr	1.3 kw hr

EQUIPMEN	IT DESCRIPTION -	 Continued

000200

Operating temperature range (surrounding)	-65° to +100°F	-54° to +38°C
Electrical requirements		
Operating voltage range	20-28.5 V	
Amperes draw (maximum above)	30°F	-1°C
Start	12.0 amp	
Run	3.5 amp	
Amperes draw (maximum below)	30°F	-1°C
Start	15.0 amp	
Run	3.5 amp	
Performance		
Fuel	grades DF-2, DFA, JP-5, JP-8	
Fuel flow rate		
High flow (normal)	0.021-0.031 lb/min	0.010-0.015 kg/min
Low flow (normal)	0.008-0.014 lb/min	0.004-0.007 kg/min
Fuel pressure (at fuel valve inlet)	3-15 psi	21-103 kN/sq cm
Fuel pump output pressure	3-6 psi	21-41 kN/sq cm
Temperature settings		
Overheat thermostat (opens)	245°F	118°C
Restriction thermostat		
Opens	220°F	104°C
Closes	190°F	88°C
Dimensions and weight		
Height	9 1/2 in	34 cm
Length	15 5/16 in	38 cm
Width	6 3/4 in	17 cm
Weight	15 lb	7 kg
Operating capacity	Must be capable of operating against 0.75 in H2O exhaust restriction	19 mm H2O
Coolant pump		
Manufacturer	MP Pumps	
Model	12245	
Part number	10160875	

Electrical requirements

Operate voltage range 20-28.5 V Ampere draw 2.0 amp

Output 12-13 gpm 45-49 liter/min

Weight (maximum) 10 lb 5 kg

Air Brake Kit (M548A1) Characteristics Metric Equivalents

Compressor

Manufacturer Bendix-Westinghouse (P/N

11634086)

Maximum operating speed 2,400 rpm

Air delivery 100 psi 689 kN/sq cm

Weight 24 lb 11 kg

Nominal rating 7 1/4 cfm at 1,250 rpm 0.2 cm m at 1,250 rpm

Reservoir

Manufacturer Midliand Steel

Bendix-Westinghouse

Maximum hydrostatic 250 psi 1724 kN/sq cm

pressure

Air capacity 1.1 cu in 0.03 cu m

Safety valve

Manufacturer Bendix-Westinghouse

Midland-Ross

Type valve Spring-loaded ball check

valve

Blowoff pressure 150 psi 1034 kN/sq cm

Panel Assembly

Manufacturer FMC

Air pressure gauge 0-120 psi 0-827 kN/sq cm

Air Brake Treadle Valve

Manufacturer Bendix-Westinghouse

Automotive Air Brake

1st 3 degrees travel 5 psi 34 kN/sq cm 2nd 17 degrees travel Graduating range 5-75 psi 34 kN/sq cm

Stop light switch

Manufacturer Bendix-Westinghouse
Type of switch Electro-pneumatic

Point closing pressure	5 psi	34 kN/sq cm
Low Pressure Indicator		
Manufacturer	Bendix-Westinghouse	
Type of switch	Spring-loaded rubber diaphragm	
Point closing pressure	54-66 psi	372-455 kN/sq cm
Governor		
Manufacturer	Bendix-Westinghouse	
Cutout pressure	100-105 psi	689-724 kN/sq cm
Cut-in pressure	80-85 psi	552-586 kN/sq cm
Material Handling Kit	Characteristics	Metric Equivalents
Material Handling Kit	P/N 11633807	
Beam:		
Туре	6 in x 4.3 lb per foot I-beam	15 cm x 2 kg per m I-beam
Length	158 3/8 in	402 cm
Weight	57 lb	26 kg
Hoist		
Capacity	1,500 lb	681 kg
Net weight	80 lb	36 kg
I-beam (minimum)	5 in x 3 in flange	13 x 8 cm
I-beam (maximum)	12 in x 5 in flange	30 x 13 cm
Chain length needed to lift load 1 foot	27.2 ft	8 m
Chain pull to lift capacity load	58 lb	26 kg
Hand chain drop	7 ft	2 m

Refer to your -10 for equipment data on caliber .50 or 7.62 mm machine gun mount kit and M66 ring mount kit. Refer to your RPSTL for equipment data on turn signal kit.

EQUIPMENT DESCRIPTION — Continued

000200

METRIC EQUIVALENTS

Metric equivalents are used throughout this manual. Metric symbols and units are:

TABLE 5. Metric Equivalents

SYMBOL	UNIT
C	Celsius
cc	cubic centimeter
cm	centimeter
j	joule
kg	kilogram
kg/min	kilogram per minute
km	kilometer
km/h	kilometer per hour
kPa	kilopascal
kw hr	kilowatt hour
1	liter
m	meter
mm	millimeter
N•m	Newton-meters



THEORY OF OPERATION

0003 00

SCOPE

This section describes how major systems and components of the carrier operate. An understanding of how each part functions in a system and how components relate to each other will help solve possible maintenance problems with the carrier.

INTEGRATED SYSTEMS AND COMPONENTS

POWER PLANT

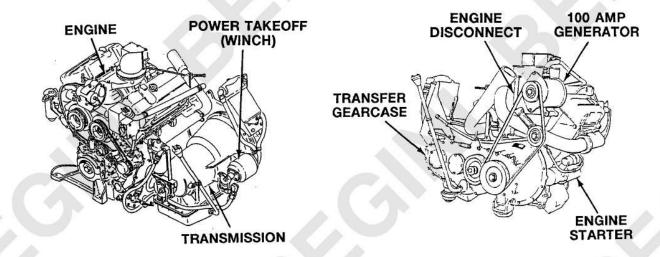
The M548A1 power plant consists of the diesel engine, transfer gearcase, and transmission. The M548A3 power plant consists of the diesel engine and hydromechanical cross drive transmission. The fuel, exhaust, cooling, starter, generator, and engine air systems are support systems are support systems for the power plant.

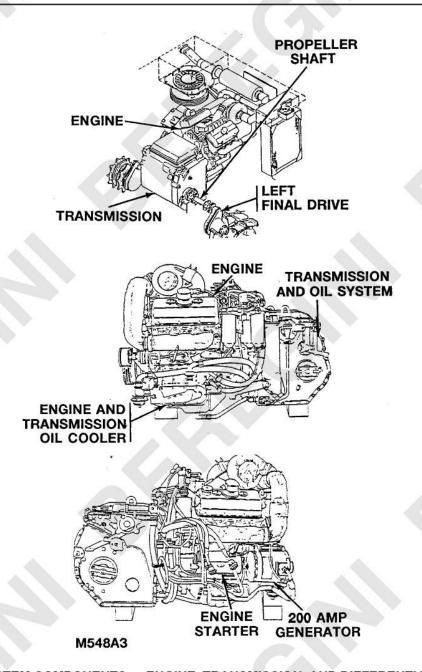
Engine power is supplied by a liquid cooled, 6-cylinder, V-type, compression ignition (diesel) unit. Starting is by a heavy duty 24 V starter. Engine is protected from low oil pressures and high temperatures by transmitters in the oil and cooling systems which activate warning light circuits.

The M548A1 transfer gearcase transfers power from the engine flywheel to the transmission torque converter through four gears at a ratio of 1 to 1.286. An engine disconnect allows the engine to operate independently of the rest of the power plant. A power takeoff within the transfer gearcase drives the cooling fan through a pulley and drive belts. Another power takeoff within the transfer gearcase drives the 100 amp generator through a pulley and drive belts. A third power takeoff within the transfer gearcase drives the winch.

The M548A1 transmission is a three speed, constant mesh, planetary gear train with hydraulic torque converter and lockup clutch. It automatically selects the proper gear based on road and load conditions and range selected. The transmission delivers power from the transfer gearcase to the differential.

The M548A3 diesel engine delivers power directly to a hydromechanical cross drive transmission with hydrostatic steering. This transmission delivers power from the engine to the left and right final drives through the propeller shafts. The final drives power the drive sprockets in the suspension system. This transmission has its own oil system with filters and separately mounted engine and transmission oil cooler. The transmission oil system is separate from the engine oil system. The 200 amp generator and cooling fan are engine driven with drive belts and pulleys.





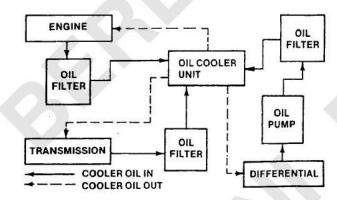
OIL COOLING SYSTEM COMPONENTS — ENGINE, TRANSMISSION, AND DIFFERENTIAL

The M548A1 engine, transmission, and differential oil cooling systems keep the oil clean and within proper operating temperature range. The components of the system are the engine, transmission, and differential oil cooler unit is mounted on the engine. By circulating the hot oil through this unit, heat is given off to the surrounding engine coolant. Engine coolant is in turn cooled by the engine cooling system.

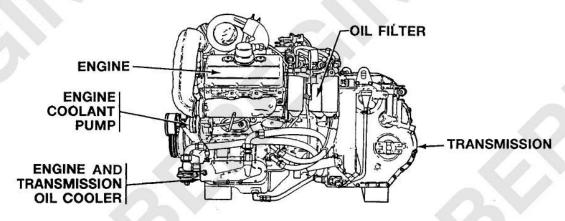
Oil cleanliness is maintained by circulating engine oil through the engine oil filter and differential oil through the differential oil filter. Transmission oil is cleaned by the transmission oil filter which is an integral part of the transmission.

Differential oil pump is mounted on the transfer gearcase. It pumps oil from the bottom of the differential housing to the differential oil filter. Oil flows through the filter and cooler and back to top of differential. a power takeoff within the transfer gearcase drives the differential oil pump.

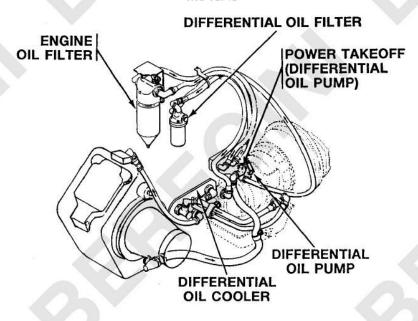
The M548A3 oil system provides lubrication for the engine. Oil is cycled throughout the engine by an engine oil pump. An oil filter cleans the oil, and engine oil cooler reduces oil temperature. The transmission oil system is incorporated in the hydromechanical cross drive transmission.



M548A1



M548A3



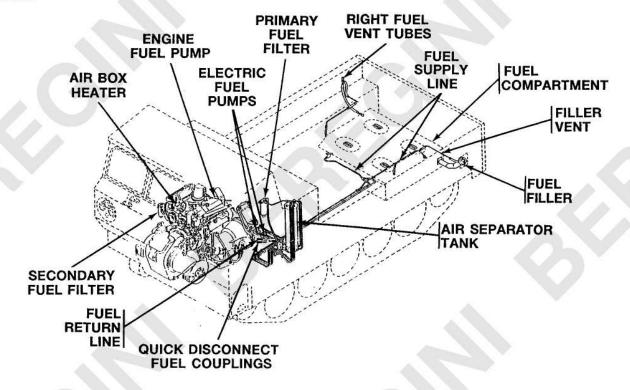
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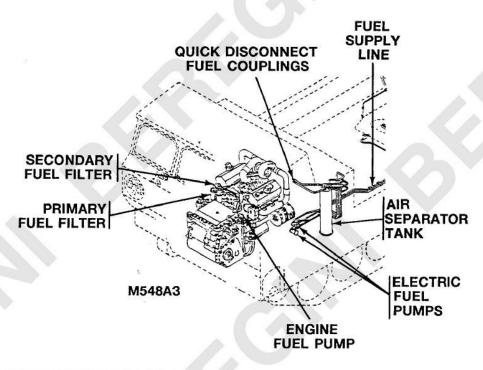
FUEL SYSTEM

The M548A1 fuel compartment is located at the rear of the carrier under the cargo compartment deck. Two electric fuel pumps supply fuel through fuel supply lines from the fuel compartment to an air separator tank. From the air separator tank, the engine fuel pump draws the fuel through the primary fuel filter. The engine fuel pump forces the fuel through the secondary fuel filter to the engine fuel injectors. It then returns surplus fuel through the air separator tanks and fuel return lines to the fuel compartment. Fuel for the air box heater is drawn from the secondary fuel filter. Quick disconnect fuel couplings are used to connect the supply and return lines to the engine. The fuel compartment is filled through a fuel filler at the left rear of the carrier and is drained through a fuel drain under the center tailgate hinge. The entire system is vented by tubes located at the right rear corner of the carrier and the fuel filler tube.

The air box heater preheats air entering the engine cylinders with an electric air pump, fuel pump, and igniter. This improves fuel ignition at low temperatures. Fuel is sprayed into the cylinder block air box and ignited to preheat incoming air.

The M548A3 fuel compartment and components are similar to M548A1. Only the front of carrier and its components are shown.

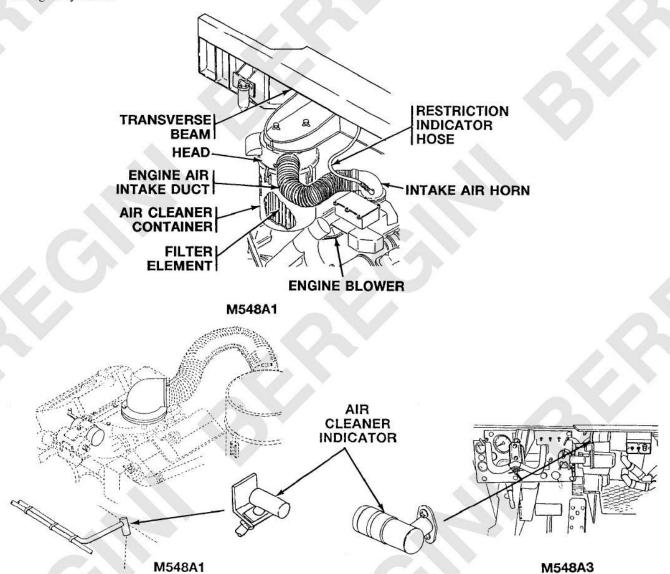


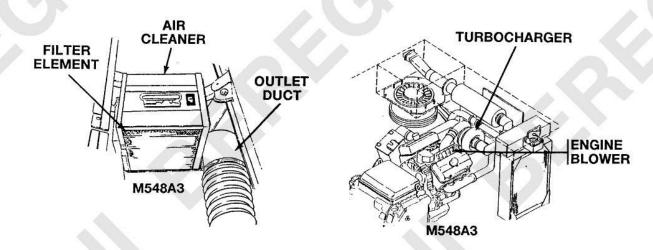


AIR INDUCTION AND EXHAUST SYSTEMS

Air for M548A1 engine combustion is drawn and filtered through an air cleaner container mounted on the transverse beam. Air enters the air cleaner through an opening in the head and filters through the air cleaner filter element. It then flows into the engine blower through an engine air intake horn between the engine air intake and air cleaner. The restriction indicator hose connects to the air cleaner indicator in the cab area. When the air cleaner element gets too dirty or dusty, the restriction of air causes the air cleaner indicator to register the change. Air is discharged at the opposite side of the engine blower, creating air pressure in the air box under the engine blower. Pressurized air blows through ports in the engine cylinders. Exhaust gases are removed and fresh air for combustion is supplied.

The M548A3 engine air system allows air to enter the engine. The air cleaner cleans air that enters the engine. Air is filtered through a reusable filter element before delivery to the engine. An air filter indicator shows when the element is clogged and needs cleaning or replacing. After being filtered, the air moves through the turbocharger to the engine blower and into the engine cylinders.



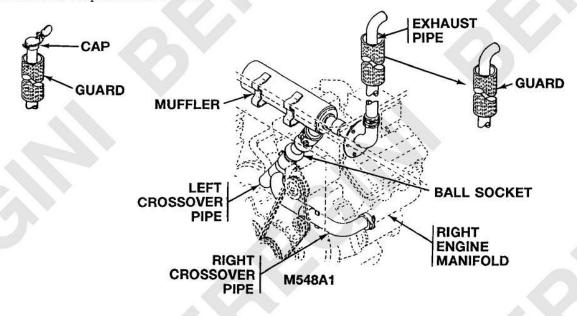


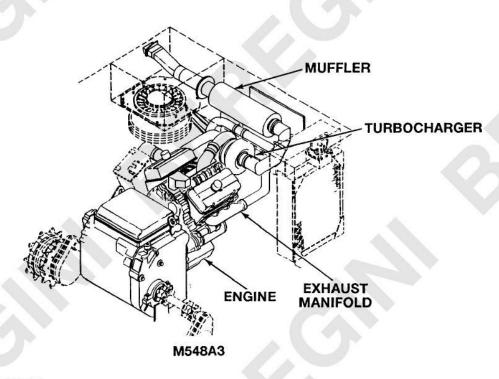
EXHAUST SYSTEM AND COMPONENTS

Burned fuel fumes from M548A1 carriers are exhausted through the right and left crossover pipes, into the muffler, and out the exhaust pipe. The crossover pipes extend from the rear of the right and left exhaust manifolds to the main exhaust pipe. The crossover pipes are joined together by sliding joints with a ball-and-socket type joint on the main exhaust pipe.

The exhaust muffler is bolted in the power plant compartment on the M548A1. An exhaust pipe (exhaust stack assembly) extends above the top of the exhaust well on both carriers. The exhaust pipe has a guard and a cap.

The M548A3 major exhaust system parts are the turbocharger, exhaust manifolds, and muffler. The turbocharger is driven by exhaust gases from the engine. The turbocharger helps the engine develop more power and operate more efficiently. The exhaust manifolds carry the exhaust gases to the turbocharger from the engine. The muffler cuts down engine noise and allows exhaust to escape outside the carrier.



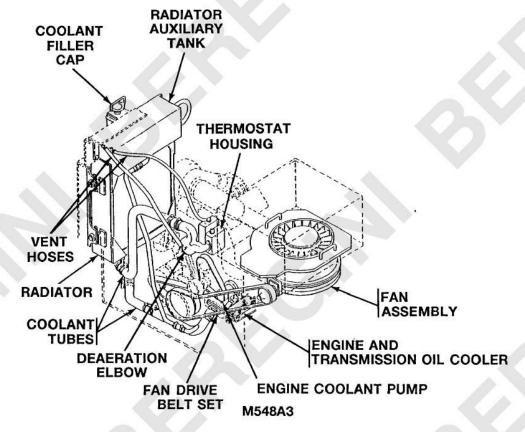


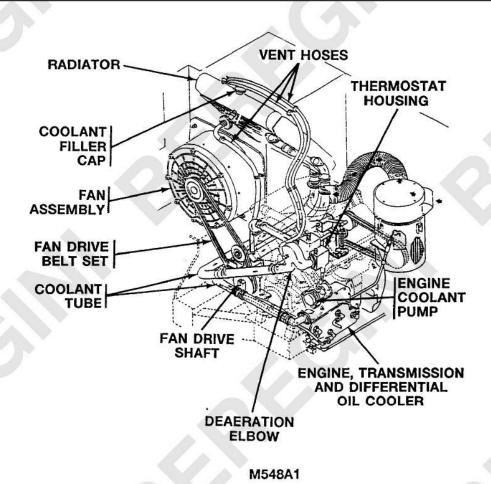
COOLING SYSTEM

The M548A1 and M548A3 cooling system consists of a radiator, engine coolant pump, thermostat, engine, transmission and differential (M548A1) oil cooler, and connecting hoses and clamps. A fan assembly provides fresh air for the engine air intake and power plant cooling systems. The fan drive belt set connects the power from the fan drive shaft (M548A1) to the fan assembly. The belt set is a matched set. If one or more belts are bad, the whole set needs to be replaced.

The fan and radiator are mounted on the right side of the power plant compartment. The engine coolant pump, thermostat, and oil cooler are integral components of the engine assembly. The coolant filler cap is where the engine coolant is filled. Coolant is drawn by the pump from the bottom of the radiator and circulated through the oil cooler, cylinder block, and cylinder heads to the thermostat housing and back to top of radiator. The thermostat is a full bypass-type with a range of $161^{\circ} - 169^{\circ}$ F ($72^{\circ} - 76^{\circ}$ C) for the M548A1 and $181^{\circ} - 189^{\circ}$ F ($83^{\circ} - 87^{\circ}$ C) for the M548A3. The deaeration elbow helps to remove air from the coolant system.

The M548A3 radiator auxiliary tank acts as an overflow tank to keep the cooling system from overpressurizing. It also removes air from the engine coolant. There is a low coolant level transmitter to signal the operator if more coolant is needed.





ELECTRICAL SYSTEM

A 24 volt direct current system supplies electrical current for the carrier. The M548A1 has two 12 volt wet-cell batteries, with an amperage capability of 100 amps per hour and connected in series. The M548A3 has four 12 volt wet-cell batteries with an amperage capability of 200 amps per hour and connected in series parallel.

The batteries supply the carrier with electricity. The vehicle compartment heater, cargo compartment heater kit, coolant heater kit, and engine starter are connected directly to the carrier batteries. See your -10 for location of all heaters. Electrical power flows from the batteries through the bus bar, cables, and wiring assemblies to the electrical equipment. The hull is a ground for the electrical system.

Battery drain is replenished and system voltage is maintained by an alternating current generator, which has 100 amps per hour capability in the M548A1 carrier and 200 amps per hour capability in the M548A3 carrier. The battery recharge current flow is regulated by the generator-regulator on top of the engine.

There are several electrical subsystems within the hull. Each subsystem contains at least one wiring assembly. A major electrical subsystem with assemblies is exterior lights, which include blackout lights, stoplight, and headlights, and interior lights, which include dome lights and panel lights.

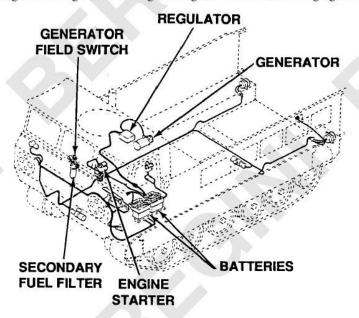
GENERATOR

The generator is part of the carrier electrical system. It is driven by the transfer gearcase on the M548A1. On the M548A3, the generator is driven by a pulley on the crankshaft of the engine. The generator charges the batteries in the carrier when the engine is running. A regulator mounted on top of the engine keeps the voltage at correct levels.

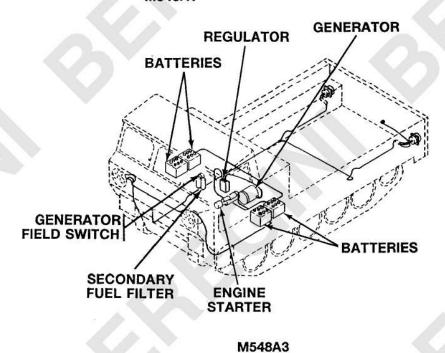
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GENERATOR FIELD SWITCH

The generator switch is mounted on the secondary fuel filter. When starting the engine, the field switch is open and the generator is not energized to allow the engine to start with less drag. When the secondary fuel filter is pressurized with fuel, the field switch closes and signals the regulator to energize the generator and start charging the batteries.



M548A1



0003 00-11

DIFFERENTIAL COMPONENTS (M548A1)

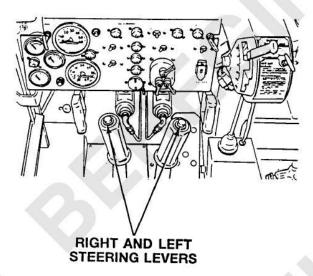
The differential consists of three major assemblies. These are the right angle gearbox, steering unit with brake shoes, and two output shafts.

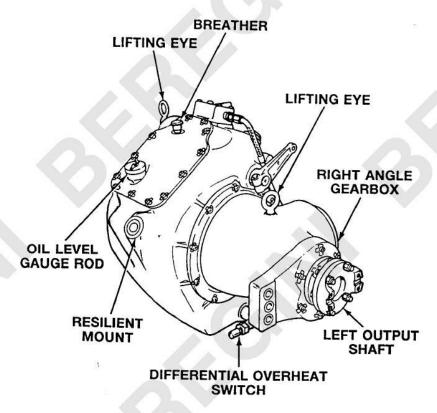
Power flows from the transmission to the right angle gearbox to the steering unit. When driving straight forward, the steering unit delivers equal power to both output shafts. Pressure on either right or left steering lever slows or stops the right or left brake drum inside the center steering unit and reduces the speed of the right or left output shaft. By slowing down one side, the differential action within the steering until increases the speed of the opposite output shaft and causes the carrier to turn in the direction of the applied brake. Pulling with equal pressure, exerted at the same time on both right and left steering levers, applies both brakes and slows or stops the carrier.

Differential is protected from high oil temperatures by a differential overheat switch connected to a warning light in the driver's compartment. The warning light comes on when the oil temperature is too high.

The breather needs to be kept clean and free of oil and dirt. If the breather is plugged, the oil inside the differential will build up pressure and blow out a gasket, preformed packing, hose, oil level gauge rod.

The resilient mount reduces shocks to the differential housing. Two lifting eyes are provided for removal and installation of the differential from the carrier.





SUSPENSION SYSTEM AND COMPONENTS

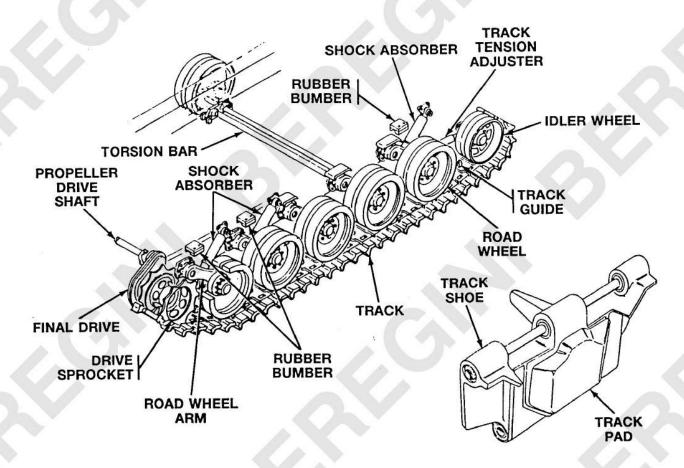
The suspension system supports the carrier and delivers engine power to the road. It allows the carrier to maneuver and be stable. Suspension system components are the drive sprockets, tracks, idler wheels, track tension adjuster, road wheels, road wheel arms, torsion bars, and shock absorbers.

The drive sprockets drive the tracks. The M548A1 drive sprockets are powered by left and right final drives from the differential. The M548A3 drive sprockets are powered by left and right final drives from the transmission. The tracks consist of two flexible chains of track shoes. The tracks ride on the drive sprockets and are guided by the road wheels and idler wheels. The idler wheels can be adjusted to maintain correct track tension.

The tracks consist of track pads bolted to track shoes that are linked together by pins to form a continuous track. The tracks, each driven by a track drive sprocket secured to the final drive, provide the surface on which the road wheels roll. Track guides keep the track centered under the road wheels. A track tension adjuster at each track idler wheel is used to adjust track tension. The track tension adjuster cylinders are filled with grease. Rubber bumpers cushion the road wheel arms when the suspension bottoms out in rough terrain.

There are five pairs of road wheels per side. Track center guides fit between each pair of road wheels. Road wheels mount on arms that are individually splined to the torsion bars. The torsion bars extend the width of the hull, are secured by torsion bar anchors bolted to the hull, and act as springs to keep the road wheels on the ground and from hitting the bottom of the carrier.

Shock absorbers stabilize the carrier when operating over rough terrain. Shock absorbers are at each first two road wheels and each rear road wheel.



PIVOT STEERING AND BRAKES (M548A1)

Pivot steering brakes are disk brakes and work like the differential brakes, but quicker. Only use disk brakes in the water or when stopped. Speeds above 10 mph (16 km/h) damage disk brakes.

AUXILIARY AUTOMOTIVE SYSTEM

The auxiliary automotive system includes driver controls, vehicle compartment heater, bilge pump, and fire suppression system.

The driver controls regulate the engine, transmission, steering, and braking systems of the carrier.

The fuel shutoff control is used to stop the supply of fuel to the injectors. To start the engine, the driver must push in the fuel shutoff control. The throttle linkages are used to control the engine speed. The gear selector allows the driver to choose the proper gear for the carrier. The steering and braking levers control separate right and left steering brakes in the control differential on M548A1. By pulling the levers, you can slow or stop either track for steering, or both tracks at once for stopping. A lock button at the top of each lever lets you set and lock the brakes for parking. On M548A3, the steering wheel controls steering and pivoting turns. On the M548A3, when the brake pedal and parking brake are applied at the same time they will hold the carrier.

THEORY OF OPERATION — Continued

0003 00

The vehicle compartment heater system provides heat inside the carrier. Major parts are the combination combustion chamber/heat exchanger, blowers, a fuel pump, and an electrical control. The heater operates using diesel fuel pumped from the fuel tank. Fuel is delivered to the combustion chamber from the fuel pump. Outside air is drawn into the combustion chamber by one of the blowers. A blower draws air from the crew compartment into the heater exchanger. The air is warmed by heat created by the combustion process and then returned to the crew compartment.

The electrically driven bilge pump removes water at a rate of 46 gpm (gallons per minute) and other liquids from the hull. Water enters the pump through a screened inlet. The pumps force water out of the carrier through an outlet tube. The bilge pump is controlled by a switch on the driver's panel.

The fire extinguisher system consists of Carbon Dioxide (CO2) cylinders; one fixed and one portable. CO2 can put out fires quickly and effectively. The fixed cylinder is located near the driver's compartment and is operated manually by pulling cables located on top of carrier next to driver's door. The fixed cylinder releases CO2 in the power plant compartment only. The portable fire extinguisher is located in the crew compartment and is manually discharged.

KIT INTEGRATED SYSTEMS

SPECIAL PURPOSE KITS

When special purpose kits are installed, their systems and components become integrated with the carrier's systems and components. The carriers may be equipped with any of the following special purpose kits.

VEHICLE COMPARTMENT (PRIMARY) KIT (M548A1)

The vehicle compartment (primary) heater kit provides heat for personnel and windshield defrosting in cold weather. The carrier can be equipped with any one of three vehicle compartment heater kits. Each kit includes a heater, fuel system, exhaust system, electrical system, and an air circulating system. Kit II includes a fuel filter. Kit I takes in air through a duct in the power plant compartment and has a tubular heat defroster manifold which crosses the width of the cab below the windshields and a duct that supplies heated air to the crew compartment. Kit II takes in cab air through a duct behind the driver's seat and has two defroster ducts, a separate duct to heat the driver's footwell, and a crew compartment heat distribution duct or manifold. Kit III is identical to Kit II except that there is no regulator valve, and two fans with individual on-off switches circulate cab air to the defroster ducts instead of air from the heater.

One of two basic heater models are furnished with the vehicle compartment heater kits. Both heaters are electrically controlled multi-fuel heaters capable of burning any hydrocarbon fuel. Air is drawn in at the top for heating and combustion. Heated air is forced out the bottom. Combustion gases are discharged outside the carrier. The heaters contain an electric glow plug, flame detector switch, and an overheat switch.

All three heater kits have the same fuel, exhaust, and electrical systems. Heater fuel system consists of an electric fuel pump and related fuel lines and fittings. Kit II also has a fuel filter routed between the fuel pump and heater. Exhaust system consists of an exhaust pipe which carries exhaust gases outside the carrier. Electrical system consists of a wiring harness and a heater control box, with the Kit III wiring harness also connecting the left and right defrost fans with two on-off control switches.

Air circulating system consists of a two stage blower, hoses and ducts, and an outlet manifold in the cab. In Kits II and III, air is drawn from behind the driver's seat into the heater. In Kit I, air is drawn from the cargo area. Kits I and II have adjustable outlet ducts in the manifold. Kit III has two defrost fans in the system.

VEHICLE COMPARTMENT (SECONDARY) HEATER KIT (M548A1)

The vehicle compartment (secondary) heater kit is used with the vehicle compartment (primary) heater during extremely cold weather, -25° to -65° F (-31° to -54° C). The kit contains a cab cover, fabric machine gun hatch cover, lower cab insulation and thermal door windows, and seat covers for driver and personnel seats.

ENGINE COOLANT HEATER KIT

Engine coolant heater kit provides heat for starting the carrier during extreme cold weather operation between -25° and -65°F (-31° and -54°C). Heater warms and circulates the engine coolant through the engine and a battery box heat exchanger which warms the engine block, lubricating oil, and battery electrolyte when the engine is not in operation.

Engine coolant heater produces heat by burning a mixture of fuel and air in a heat exchanger. Air is supplied for combustion by a blower through a connecting tube to the burner air inlet in the heat exchanger. Electrical components are connected to the wiring harness through a bracket mounted terminal strip located on the side of the heater.

Heater has fuel, exhaust, and electrical systems. Fuel system consists of a fuel pump, fuel manifold, fuel control valve, and related fuel lines and fittings. Exhaust system consists of an exhaust pipe with a removal moisture trap, which carries exhaust gases out of the heater. Electrical system consists of a coolant heater control box and a wiring harness which supplies power to heater control box, coolant heater fuel pump, and coolant pump.

Engine coolant heater kit has a coolant circulating system, which consists of an electrically operated coolant pump. The pump circulates coolant through the heater and engine battery box heat exchanger plate and back through the coolant heater.

AIR BRAKE KIT (M548A1)

The air brake kit provides regulated, pressurized air to operate the trailer equipment air brakes. The kit's main components are a compressor, reservoir, governor, safety valve, and stop light and air low pressure switches. Other components are a treadle valve pedal, dial-type air pressure indicator and warning light, disconnect and air couplings, and dummy fittings.

Compressor is engine driven and air cooled. It charges a 1,100 cubic inch (0.016 cu m) storage reservoir at the rate of 7 1/4 cfm (0.2 cu M) at an engine speed of 1250 rpm. Air is drawn through a strainer into compressor cylinders, compressed by pistons, and then forced through discharge valves and a hose and a tube into a reservoir.

Reservoir stores pressurized air for brake operation and is a place for air, heated during compression, to cool. Cooling causes oil and water to condense to form an oil-water emulsion.

The governor receives air from the reservoir at one of it reservoir ports. Air acts on the piston and the inlet and discharge valve. When air pressure reaches a cutout setting of the governor, piston and inlet and discharge valve move up. The discharge stem of the inlet passage opens and allows reservoir air to flow by the open inlet valve through a drilled passage in the piston and out to the unloading mechanism in the compressor. Air flows around the piston and acts on an additional area of the piston, assuring full opening of the inlet passage. As air pressure drops to governor cut-in setting, force exerted by air setting spring moves the piston down, which causes the inlet stem of the inlet and discharge valve to set. The discharge passage opens and allows air at the compressor unloader pistons to escape back through the piston and discharge stem and out the discharge port.

A spring-loaded ball check safety valve protects the air brake system against air pressure above 150 psi (1034 kN/sq cm). The valve lifts and lets air discharge if pressure in reservoir rises above 150 psi (1034 kN/sq cm).

The air brake kit has a stop light and air low pressure switches. The stop light switch is an electro-pneumatic switch, which operates in conjunction with the brake valve and stop light and closes the stop light electrical circuit when the brakes are applied. The air low pressure switch is a safety device, which lights a warning light on the air brake instrument panel when reservoir air pressure falls below 60 psi (418 kN/sq cm) and closes electrical contacts on the rubber diaphragm with spring pressure.

Other components are a treadle valve pedal, dial-type air pressure indicator and warning light, disconnect and air couplings, and dummy fittings. Compressed air flow to the towed load is controlled by foot pressure on the treadle valve pedal, which bears down on a plunger in the treadle valve. Treadle valve pressure also actuates the stop light switch. A dial-type air pressure indicator and warning light, which show condition of the air brake system, are on the air brake instrument panel. Disconnect couplings are located on the rear cab bulkhead above the left power plant compartment grille and connect to service and emergency air brake hoses that run along left side of hull to rear of carrier. Two air couplings on the hose ends permit connections to towed equipment brake couplings, are closed by dummy fittings when not in use, and are stowed on the cargo door.

0003 00

TURN SIGNAL KIT

Turn signal kit provides directional turn signals and hazard warning lights on the carrier to comply with regulations for highway operation. Turn signal lights are added on front of carrier. Right stop light-taillight is replaced with a dual purpose stop light-taillight. A blackout stop light-taillight is added on right rear of carrier. Reflectors are added on rear of carrier. Trailer light wiring harness is replaced to provide for adaptation of turn signals on any towed load. A control and flasher are added in cab. A wiring harness an leads connect the control, flasher, and lights to carrier lighting system.

CARGO AREA (PRIMARY) HEATER KIT

Cargo area (primary) heater kit provides heat for personnel seated in the cargo area. Heater kit contains one of two model heaters: Model 8460C or MF510A. Both heaters are electrically controlled, multi-fuel burning units. Air is drawn at the top for heating and combustion. Heated air is forced out the bottom. Combustion gases are discharged outside the carrier. Heater contains an electric glow plug, detector switch, and an overheat switch. heater has fuel, exhaust, and electrical systems. Fuel system consists of an electric pump and related fuel lines and fittings. Exhaust system has an exhaust pipe, which is enclosed in a two-piece heat guard, with related clamps and brackets. Electrical system consists of a wiring harness and a heater control box.

CARGO AREA (SECONDARY) HEATER KIT

Cargo area (secondary) heater kit is used with the cargo area (primary) heater kit during very cold weather -25 °to -65 F (-31 °to -54 °C). Kit consists of an insulated cargo compartment cover, heater exhaust closure cone, an insulated escape hatch cover, foam insulation for cargo door, plywood floor plate covers, and two cloth covers for the personnel seats.

CALIBER .50 MACHINE GUN MOUNT KIT

Caliber .50 machine gun mount kit consists of ring mount M49A1, four supports, pintle, and cradle. Each front support carries a tray for stowage of an ammo box and straps which secure the ammo boxes. Ring mount M49A1 consists of a ring (track), carriage link, backrest, cradle, and ammo box tray. Carriage link and backrest rotate 360° on the ring and can be secured in any position by a hand brake. Cradle is installed in the carriage, mounts the machine gun, and permits 360° of traverse, 80° of elevation, and 20° of depression. Machine gun is fed by a tray supported ammo box mounted on the cradle's left side. A canvas deflector mounted under the carriage deflects ejected cartridges away from the operator.

M66 RING MOUNT KIT

M66 ring mount kit consists of ring mount M66, four supports, deflector support, cartridge deflector, four straps, and attaching hardware. Two front lifting eyes are stowed on a crossbeam in the cargo compartment. Two front supports are bolted to the lifting eye brackets forward of the windshield. Two rear supports are bolted to brackets on the cab transverse beam. Each front support carries a tray for stowage of an ammo box and straps which secure the ammo boxes.

M66 ring mount consists of a ring mount and a .50 caliber machine gun mount. M66 ring mount can also be used with 7.62 mm machine gun. The ring mount consists of a series of rings rotating on disks, a backrest, ring brake, and a pintle traverse lock. The cartridge deflector and deflector support are attached to the ring mount. The .50 caliber machine gun mount consists of a pintle, cradle equilibrator spring, ammo box tray, and mounting and locking pins.

7.62 MM MACHINE GUN MOUNT KIT

The 7.62 mm machine gun mount kit is used to mount a 7.62 mm machine gun M60 over the carrier cab. Kit consists of a pintle, platform, and cradle and holder. Kit does not contain a cartridge case deflector or tripod stowage bracket. A pintle connects other components of a gun mount to the ring mount assembly. A platform supports the 7.62 mm machine gun and retains the gun with a platform latch. The cradle and holder support and retain a box of 7.62 mm ammo. A screw on the pintle permits adjustment of maximum depression.

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THEORY OF OPERATION — Continued

0003 00

MATERIAL HANDLING KIT

Material handling kit is used to load and unload cargo. It provides seating for a four man crew and stowage for up to six rifles on the cargo floor. Beam supports are installed on the cargo/over bows and are adjustable. Beam can be set and locked in several positions. Hand operated hoist can be moved and secured in any position on the beam. Bulkhead protector prevents damage to the power plant compartment bulkhead during loading and unloading of cargo.

REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

0004 00

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to Modified Table of Organization and Equipment (MTOE) for your unit.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools and support equipment are needed for unit maintenance. They are listed in listed in Repair Parts and Special Tools List (RPSTL) TM 9-2350-247-24P. Common tools and supplements and special tools and fixtures are listed in WP 0541 00.

REPAIR PARTS

The Maintenance Allocation Chart lists those parts you are authorized to replace at the unit maintenance level. Repair parts for the M548A1 and M548A3 can be ordered from and are listed and illustrated in the Repair Parts and Special Tools List (RPSTL) TM 9-2350-247-24P.

SPECIAL PURPOSE KITS

For parts, tools, and equipment in the caliber .50 machine gun mount and M66 ring mount kits, see your -10.



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CHAPTER 2

UNIT TROUBLESHOOTING PROCEDURES

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ENGINE CRANKS SLOWLY (M548A1)	0012 00
ENGINE CRANKS SLOWLY (M548A3)	0013 00
ENGINE CRANKS BUT WILL NOT START	
ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)	
ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A1)	0016 00
ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)	0017 00
ENGINE FUEL SYSTEM SCHEMATIC	0018 00
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STARTING SYSTEM SCHEMATIC (M548A3)	0020 00
AIR BOX HEATER SYSTEM SCHEMATIC	
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100 AMP CHARGING SYSTEM MALFUNCTIONS (M548A1)	
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200 AMP NO CHARGE/REGULATION TROUBLESHOOTING (M548A3)	
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HI TEMP DIFF OIL INDICATOR COMES ON (M548A1)	0031 00
HI TEMP TRANS OIL INDICATOR COMES ON (M548A1)	0032 00
HI TEMP TRANS OIL INDICATOR COMES ON (M548A3)	0033 00
NO EXTERIOR LIGHTS OPERATE	
BLACKOUT DRIVE LIGHT DOES NOT WORK	0035 00
SERVICE HEADLIGHTS DO NOT OPERATE	0036 00
INFRARED HEADLIGHT(S) DOES NOT OPERATE	
SERVICE AND/OR BLACKOUT STOPLIGHTS MALFUNCTION	
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CHAPTER 2

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CHAPTER 2

UNIT TROUBLESHOOTING PROCEDURES

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UNIT TROUBLESHOOTING PROCEDURES

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STE/ICE-R TEST 10 ENGINE RPM	
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INTRODUCTION TO HOW TO USE TROUBLESHOOTING

0005 00

PURPOSE

The purpose of unit maintenance level troubleshooting is to diagnose carrier problems which are reported to unit maintenance. Troubleshooting tasks in this manual are common to all carriers except where indicated. You should not begin unit maintenance troubleshooting until all operator troubleshooting procedures have been completed. You will perform four actions in unit maintenance troubleshooting:

- (1) Before starting a troubleshooting task, verify that the reported problem is present in the carrier.
- (2) After verifying the symptom, find the part that is causing the problem.
- (3) Replace or adjust that part.
- (4) Check to make sure the problem no longer exists, and that there are no other problems.

DEFINITIONS AND DESCRIPTIONS OF TROUBLESHOOTING PROCEDURES

Troubleshooting tasks always have a beginning and an end. You will use task steps, test procedures, indexes, maintenance tasks, and other technical manuals to troubleshoot. Troubleshooting uses the following terms that are not used in other kinds of tasks:

1. FAULT: The part that is not operating correctly and is causing the problem.

2. SYMPTOM: The problem reported to unit maintenance.

3. VERIFY NO FAULTS After you have completed the corrective action, you must verify that no faults exist.

If the fault condition still exists, then the fault is not fixed or there is another fault. If this happens, start at the beginning of the troubleshooting procedure until you find and correct all faults. Always operate the system and/or carrier to make sure that you have corrected the reported problem. If troubleshooting does not identify a

faulty part, the carrier is defective beyond the level of unit maintenance.

4. LIGHT BULB CHECK: In troubleshooting tasks checking indicator lights, light bulb is good if multimeter

indicates any continuity.

TROUBLESHOOTING BASICS

Troubleshooting Procedure

FOUND:

A troubleshooting procedure serves as a starting point for your troubleshooting work. You will branch in and out of procedures as you work to find a fault. Also, you will correct the fault and check that the fault has been corrected. The parts of a troubleshooting procedure are given below.

Legend

1 TITLE This is the name of the procedure.

2 INITIAL SETUP This tells you the tools, materials/parts, personnel, references, and equipment

conditions needed to do the procedure.

3 TASK STEPS These boxes give you step-by-step instructions.

4 ILLUSTRATIONS These help you locate and identify parts.

5 QUESTIONS This is the last step in YES blocks. The answer to this question will direct you to

the next block.

6 REFERENCE LETTER This will send you to the correct block to continue with the troubleshooting

procedure.

INTRODUCTION TO HOW TO USE TROUBLESHOOTING—Continued

000500

Locating the Correct Troubleshooting Procedure

- (1) Carrier arrives at shop.
- (2) Read DA form 2404.
- (3) Verify that the problem on DA form 2404 exists.
- (4) Look up the carrier symptom in Troubleshooting Task Index. (WP 0006 0), in this chapter and go to that task.

Doing the Troubleshooting Procedure

- (1) Make sure you have all items in INITIAL SETUP.
- (2) Perform required action(s) in Equipment Conditions.
- (3) Complete the first block of task steps.
- (4) Refer to system schematic or diagram for system components, detail, and clarification.
- (5) Answer the question at the bottom of the first block.
- (6) Follow YES or NO arrows to the next block.
- (7) Move from block to block. Answer questions and follow instructions. You may be directed to:
 - do further checks and tests on parts;
 - go to another manual and do tasks;
 - or go to another task in this manual.

NOTE

After completing the actions called for on another page or manual, return to the point in the troubleshooting procedure where you left off.

- (8) Locate the fault in the carrier or part and perform the corrective action.
- (9) Check to make sure fault is corrected and no new faults are found.
- (10) Button up by installing items in Equipment Conditions after finishing the troubleshooting task.

INTRODUCTION TO HOW TO USE TROUBLESHOOTING—Continued

000500

TROUBLESHOOTING SAMPLE

The following description takes you through a typical troubleshooting procedure.

Finding the Right Troubleshooting Procedure

A carrier arrives at the shop. The DA form 2404 shows that the engine cranks but will not start. Engine cranks but will not start is part of the carrier Engine System. Therefore, you look up engine cranks but will not start listed under Engine System in Troubleshooting Task Index, (WP 0006 00), in this chapter.

Check title to make sure you are troubleshooting the correct system for the problem. Next, read the INITIAL SETUP carefully. Make sure you have all the items listed in the INITIAL SETUP. Some access steps in Equipment Conditions may not need to be performed depending on the fault location. The INITIAL SETUP also includes tools and references. In instances where STE/ICE-R troubleshooting may be more advantageous and time saving for the user, cross references to [WP 0107 00], STE/ICE-R troubleshooting, are given under references. [WP 0107 00] contains references to standard troubleshooting procedures. It's up to you to decide which are necessary for your particular problem.

Now you're ready to begin troubleshooting. Look at the first block. Do step 1. Does bilge pump fail to come on? If the answer is NO. Follow the NO arrow to the reference indicated. If the answer is YES. Follow the Yes arrow to the next box. Do steps 1 through 3. Let's say the multimeter reads 17 volts. The answer to the question, "Does multimeter read more than 17 volts," is NO. Follow the NO arrow to the reference indicated. Lets say the multimeter reads more than 17 volts. The answer to the question, "Does multimeter read more than 17 volts," is YES. Follow the YES arrow to the next box.

Follow the YES box on the following page. Do steps 1 and 3. In this sample, let's say the multimeter reads more than 1/2 volt. The answer to step 3 is NO. Follow the NO arrow to the the reference indicated.

The NO arrow takes you to the next box. This box gives you the step to correct the fault. Do step 1. It tells you to go to another task in the manual. Go to the page shown and perform the task. Return to this box when you have completed the task. Step 2 in this box is "Verify no faults found." You must check to make sure you have correctly fixed the fault.

After no faults found has been verified, return carrier to operation. This is the end of the troubleshooting sample.



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ENGINE OVERHEATS (M548A1)

0007 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Radiator Test Kit (WP 0541 00, Item 54)

Personnel Required

Unit Mechanic

References

See your -10

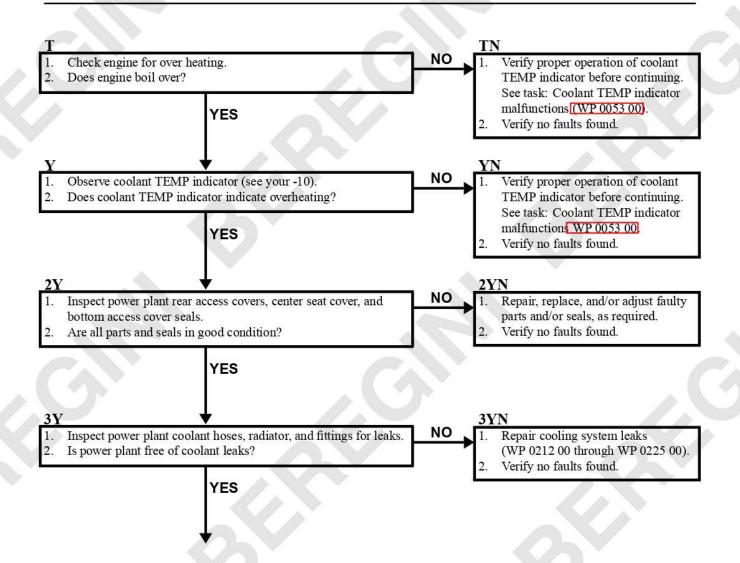
Equipment Condition

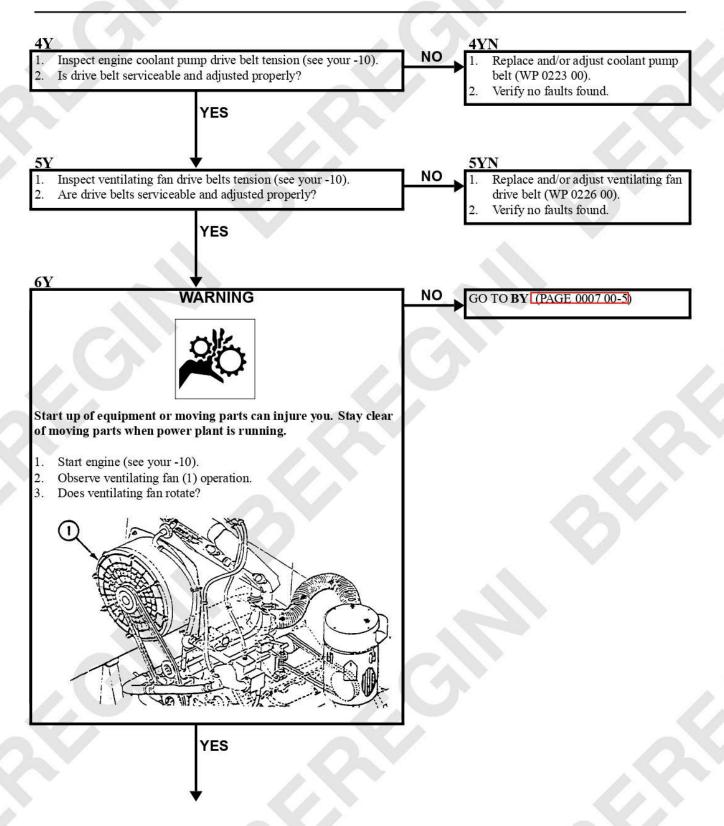
Engine stopped (see your -10)

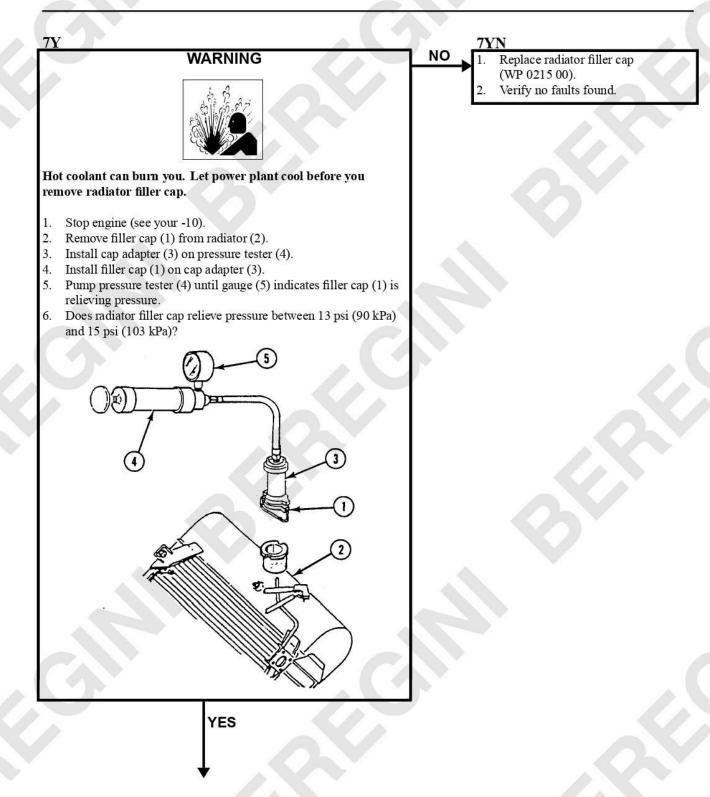
Carrier blocked (see your -10)

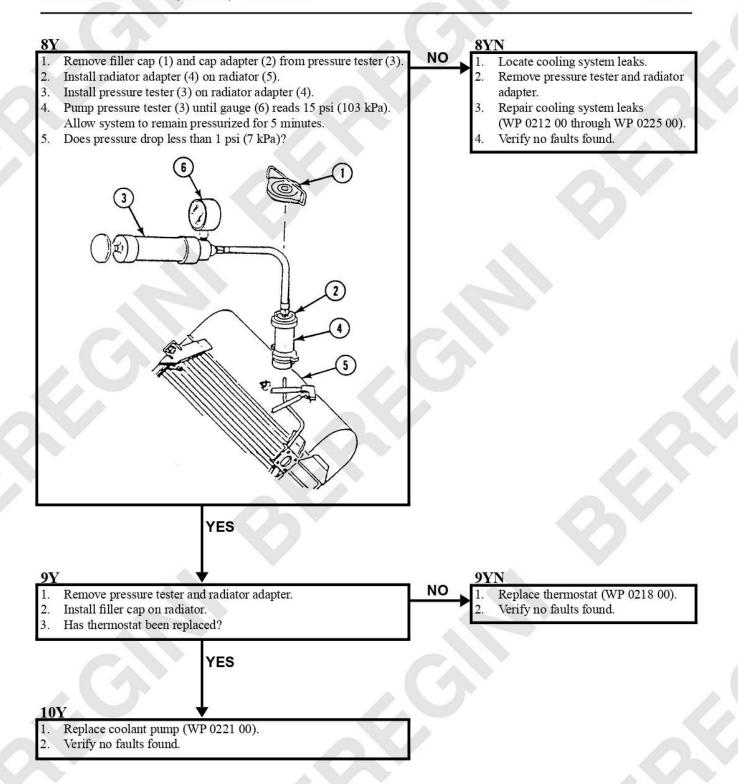
Center seat raised (see your -10)

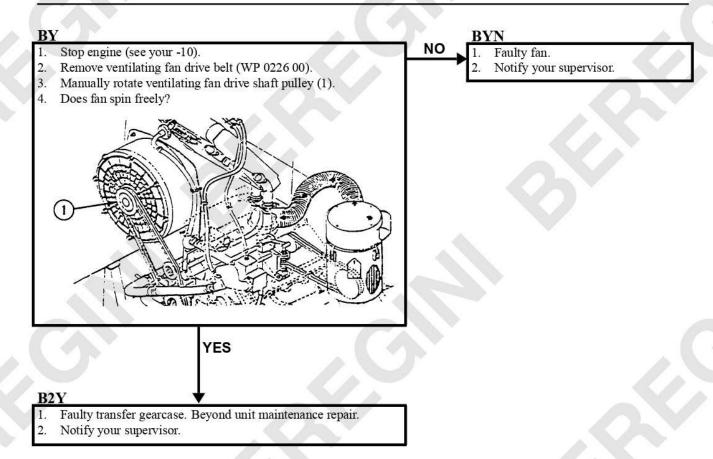
Power plant upper rear access door opened (see your -10) Hull bottom access cover removed (WP 0383 00)













ENGINE OVERHEATS (M548A3)

0008 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Radiator Test Kit (WP 0541 00, Item 54)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

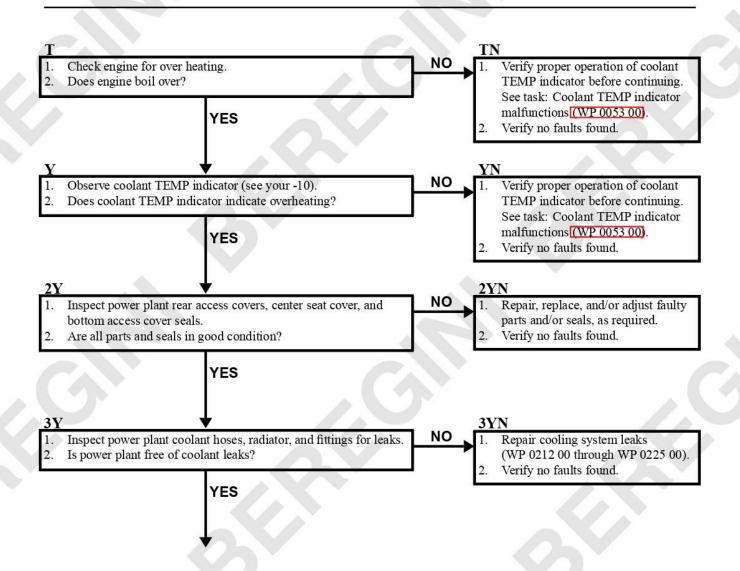
Carrier blocked (see your -10)

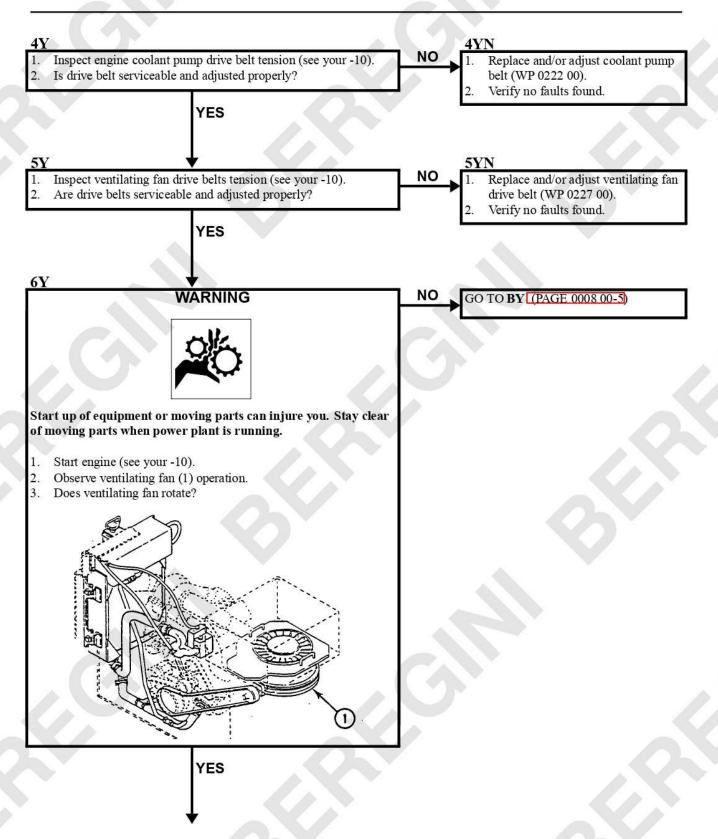
Center seat raised (see your -10)

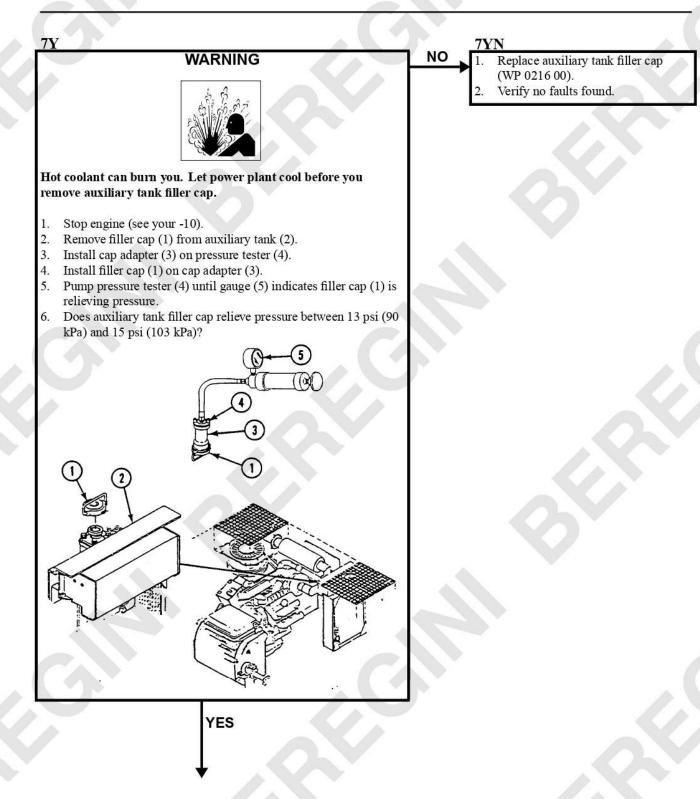
Power plant rear access panel removed (see your -10)

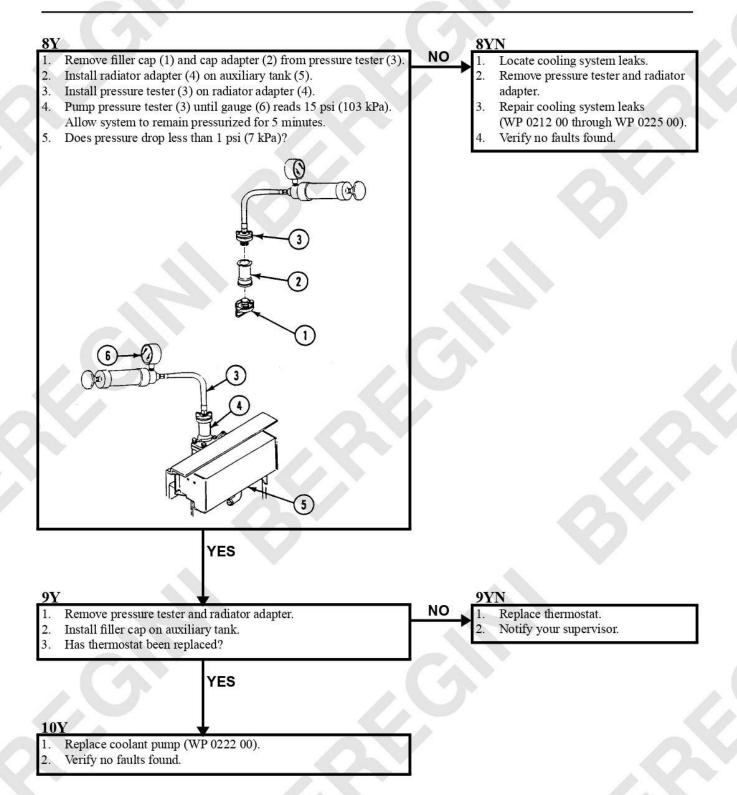
Left grille removed (see your -10)

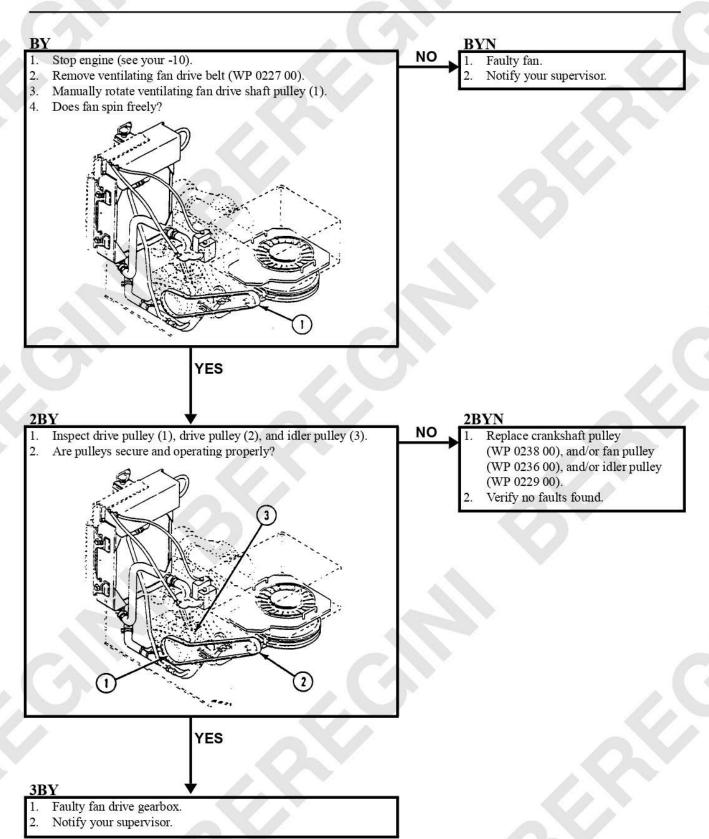
Hull bottom access cover removed (WP 0383 00)













ENGINE WILL NOT REACH OPERATING TEMPERATURE

0009 00

INITIAL SETUP:

Maintenance Level

Unit

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

Personnel Required

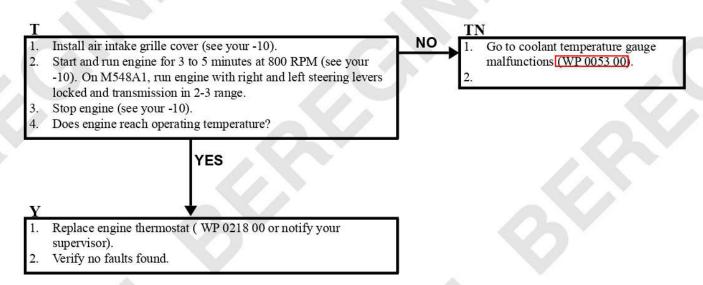
Unit Mechanic

References

See your -10

NOTE

M548A1 and M548A3 troubleshooting procedures are the same.





ENGINE DOES NOT CRANK (M548A1)

0010 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6) Multimeter (WP 0541 00, Item 29) Socket Wrench Set (WP 0541 00, Item 64)

Personnel Required

Unit Mechanic Helper (H)

References

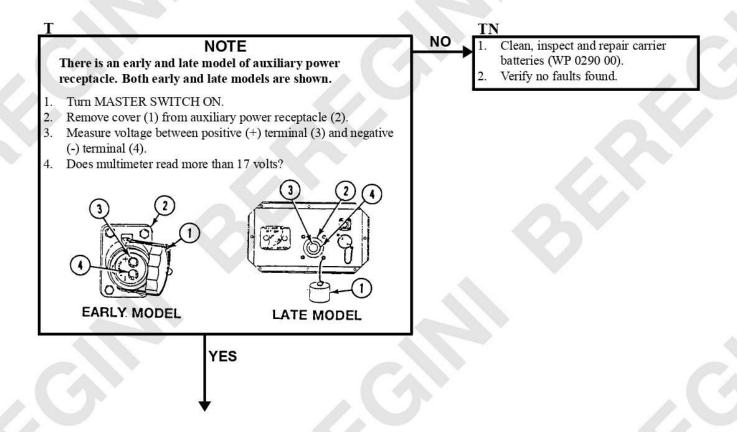
See your -10 (WP 0112 00)

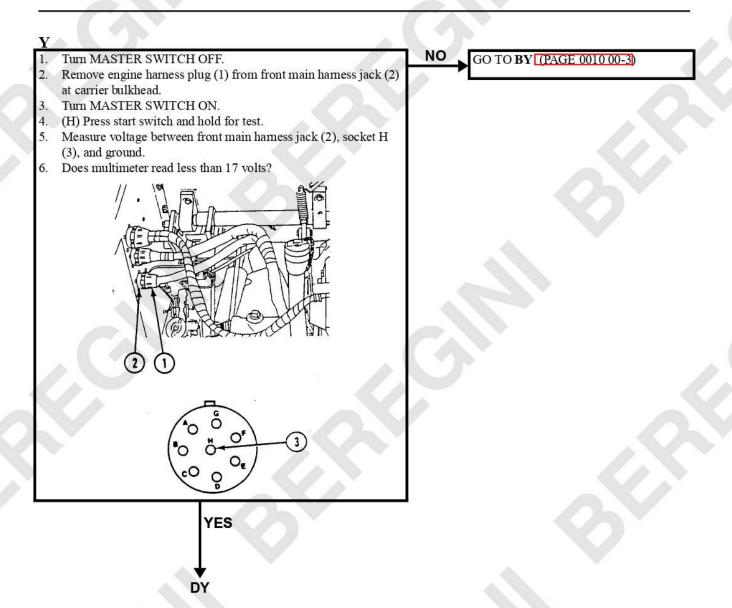
Equipment Condition

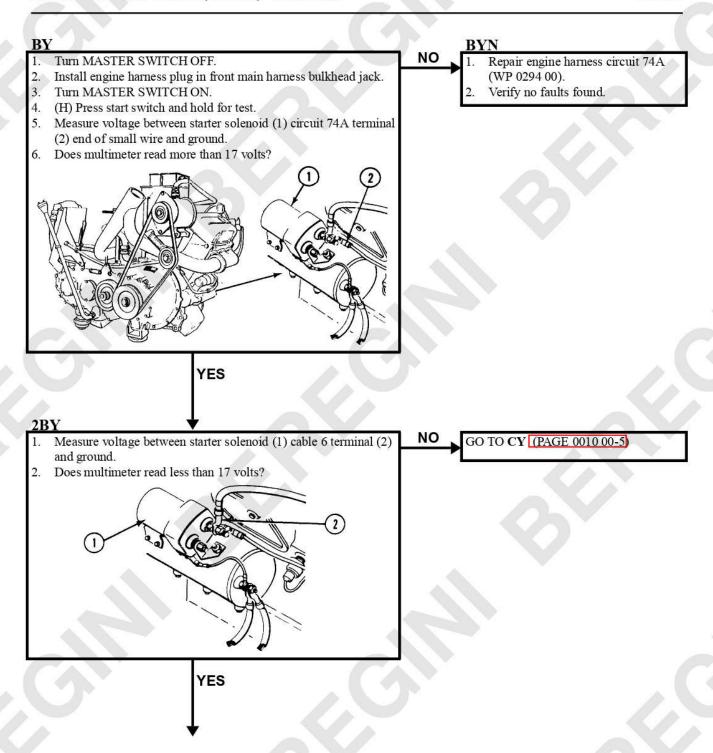
Engine stopped (see your -10)

Carrier blocked (see your -10)

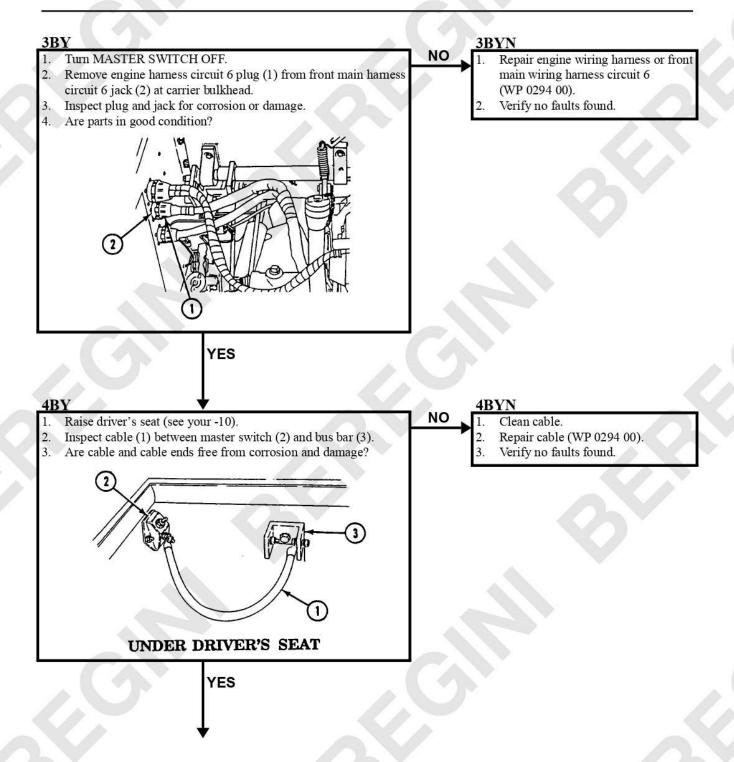
Center seat raised (see your -10)

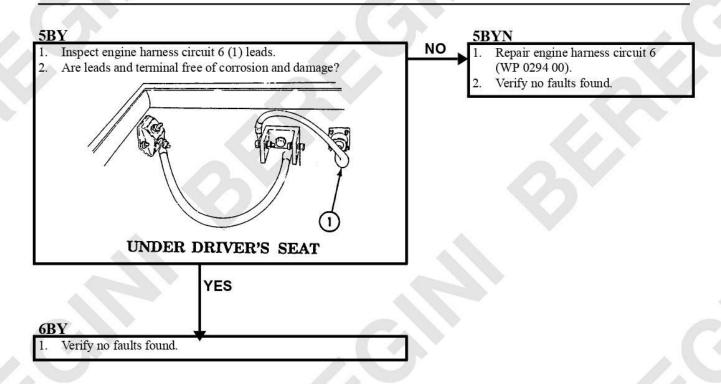


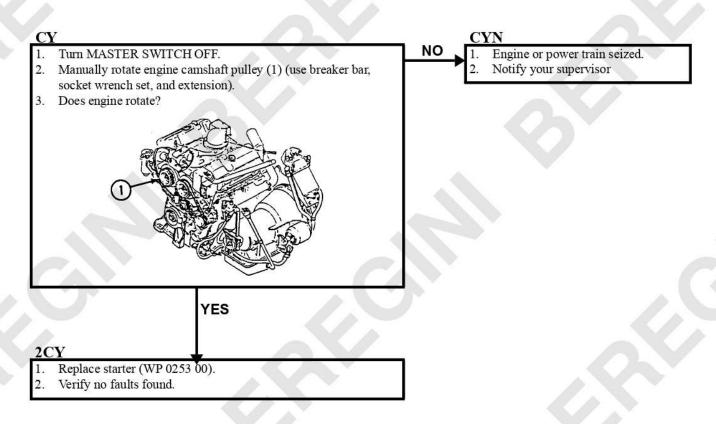




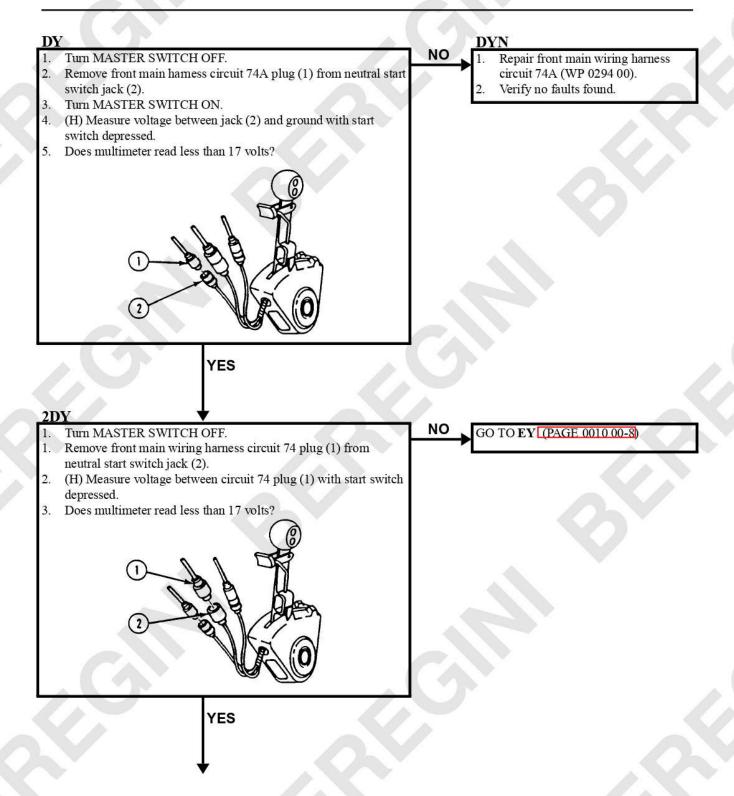
ENGINE DOES NOT CRANK (M548A1)—Continued

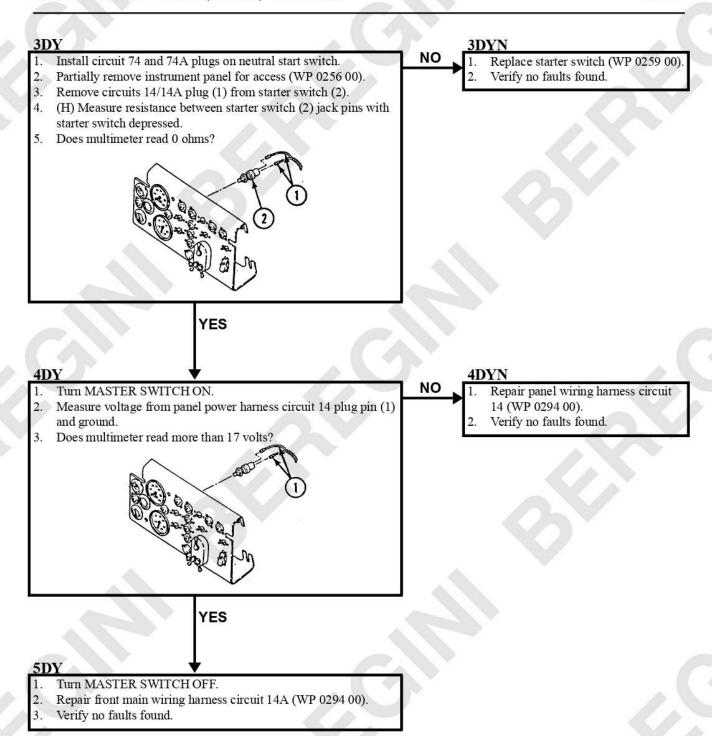




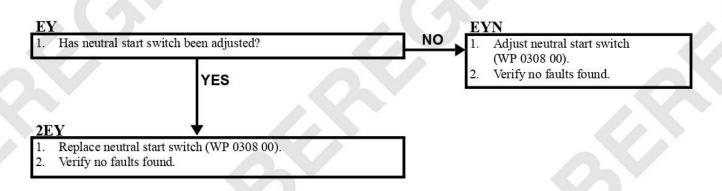


ENGINE DOES NOT CRANK (M548A1)—Continued





ENGINE DOES NOT CRANK (M548A1)—Continued



ENGINE DOES NOT CRANK (M548A3)

0011 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

Helper (H)

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

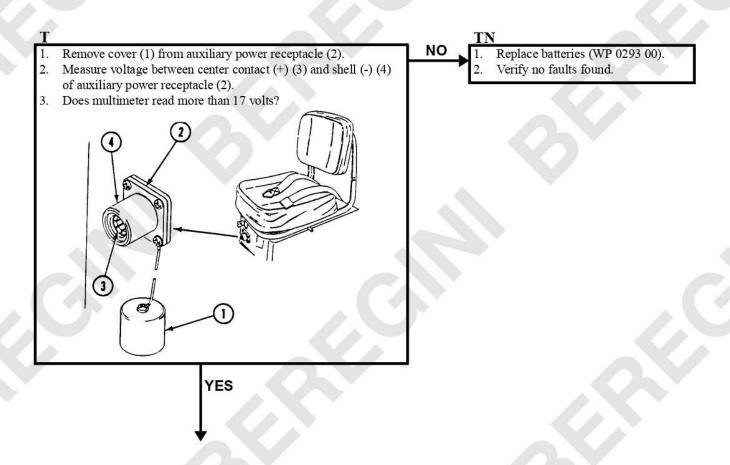
Power plant rear access panel removed (see your -10)

Center and driver's seats raised (see your -10)

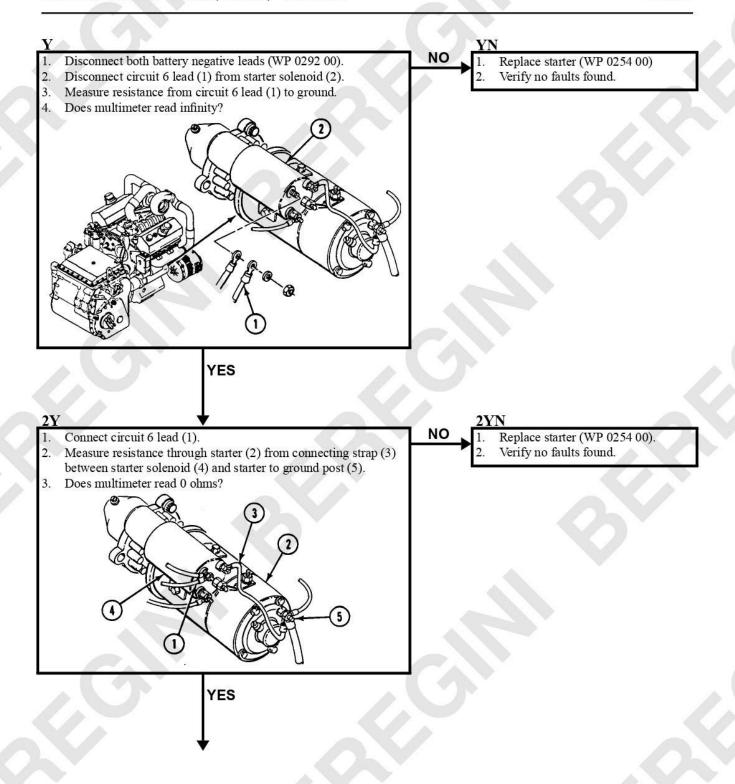
Hull bottom access cover removed (WP 0383 00)

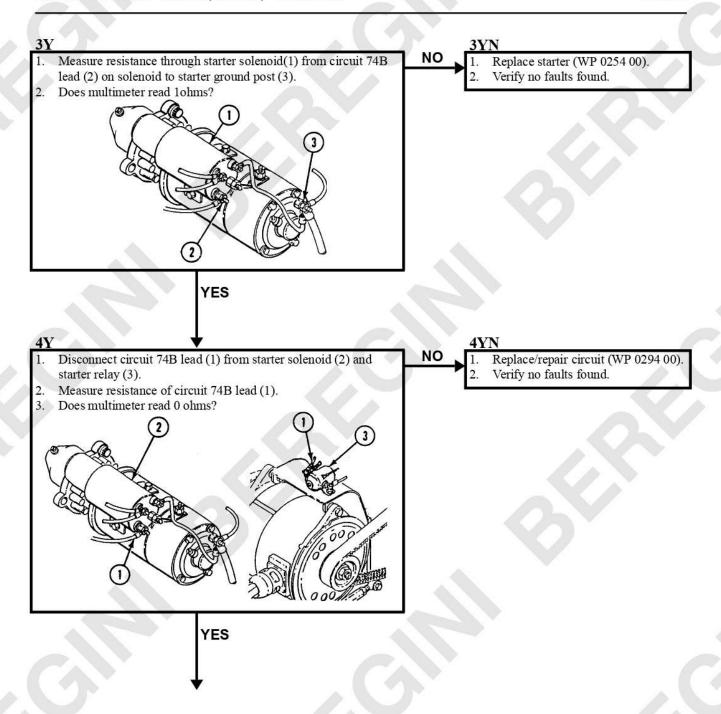
NOTE

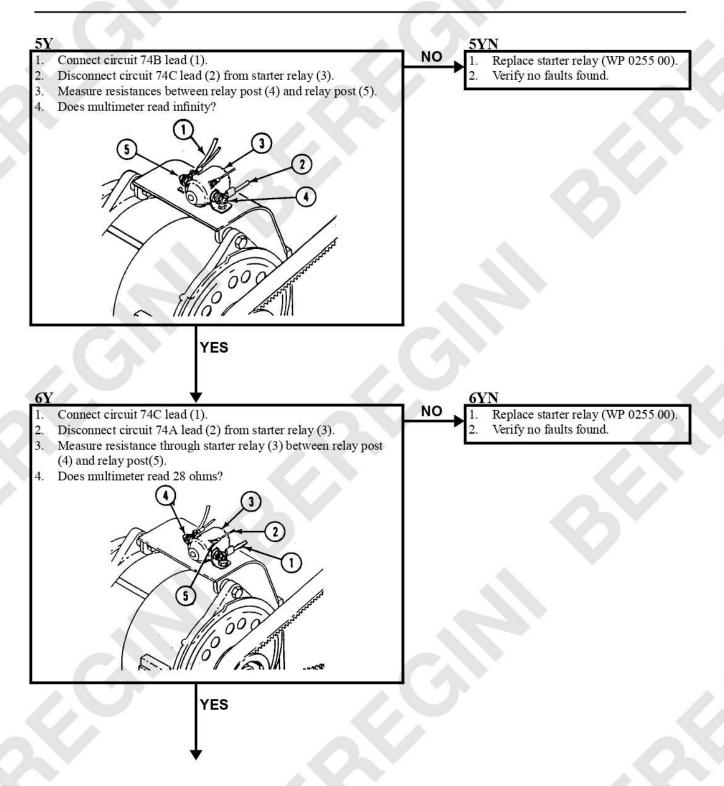
A helper is needed throughout task.

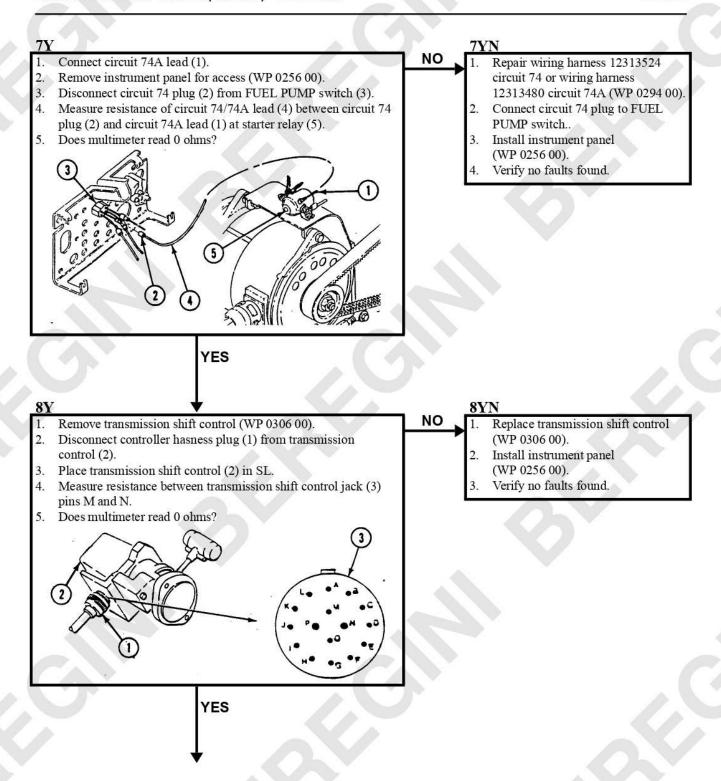


ENGINE DOES NOT CRANK (M548A3)—Continued

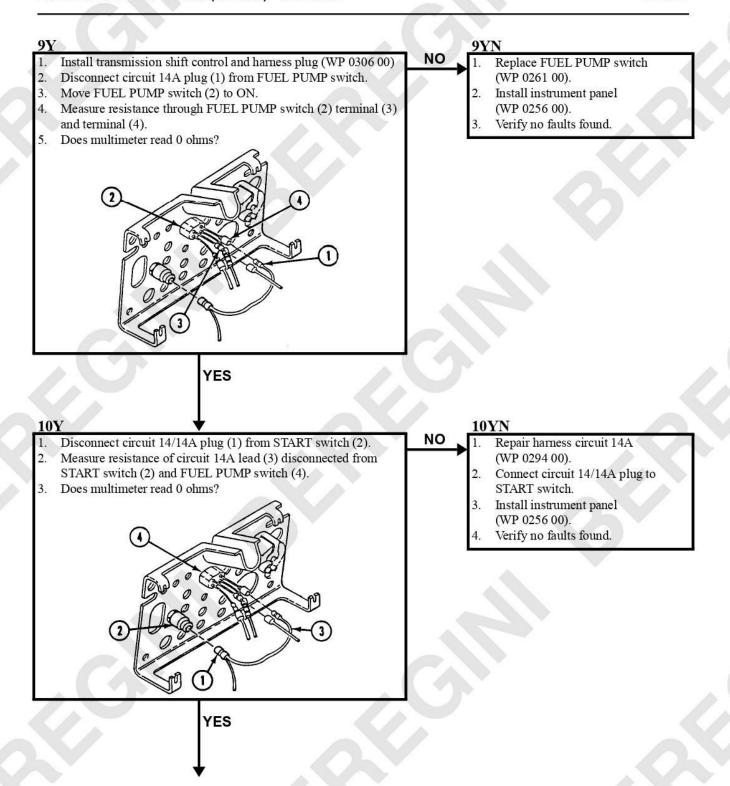


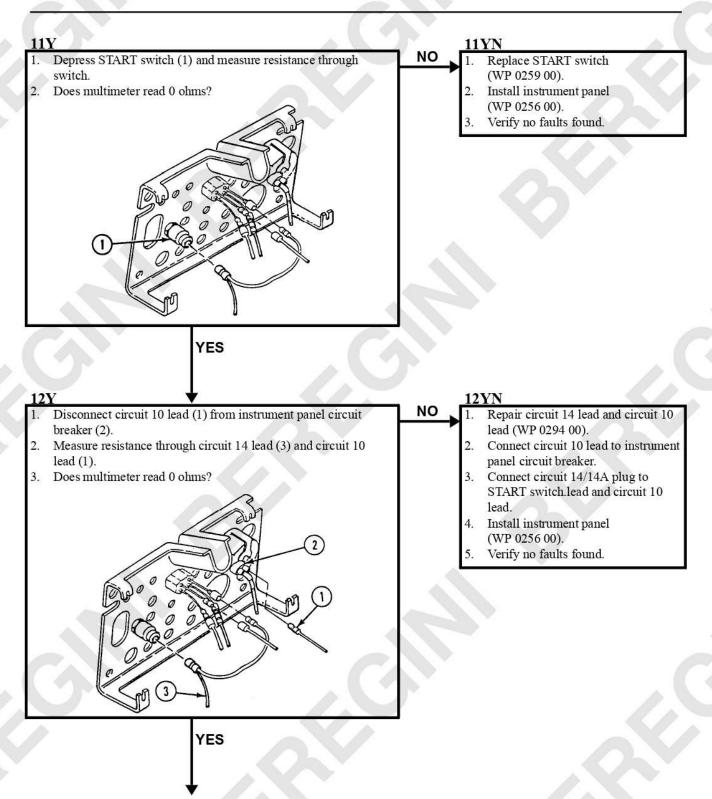


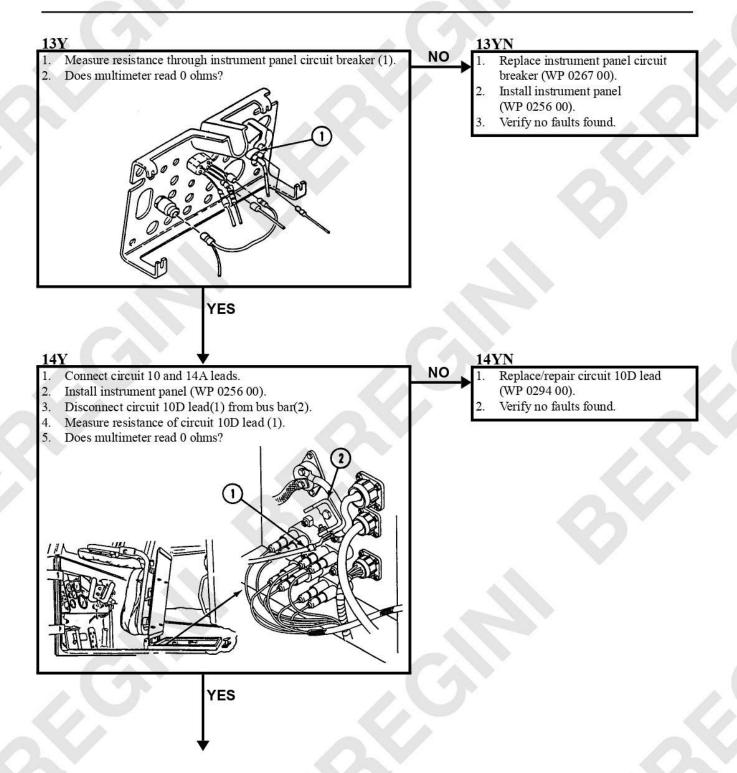


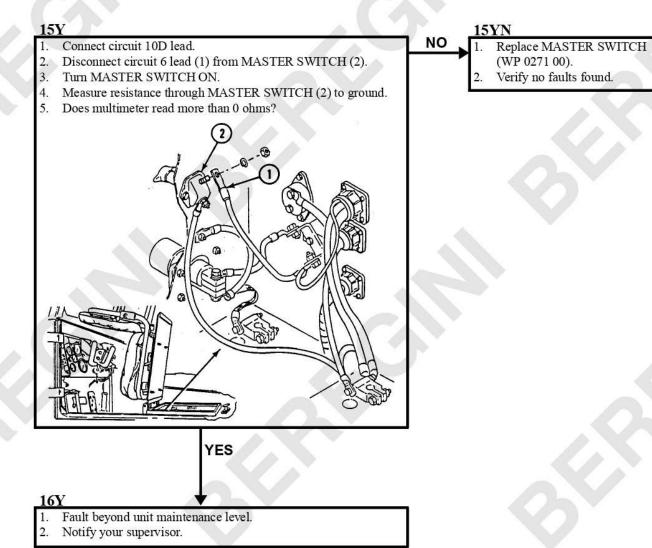


ENGINE DOES NOT CRANK (M548A3)—Continued











ENGINE CRANKS SLOWLY (M548A1)

0012 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic Helper (H)

References

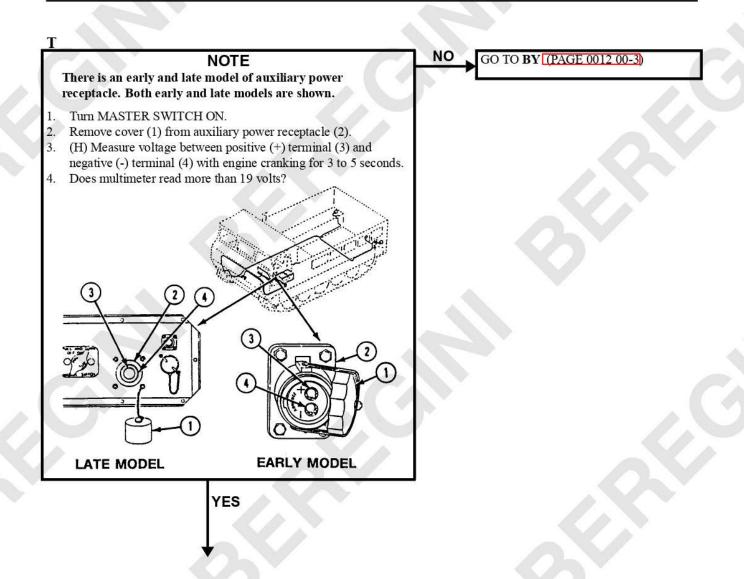
See your -10 (WP 0109 00)

Equipment Condition

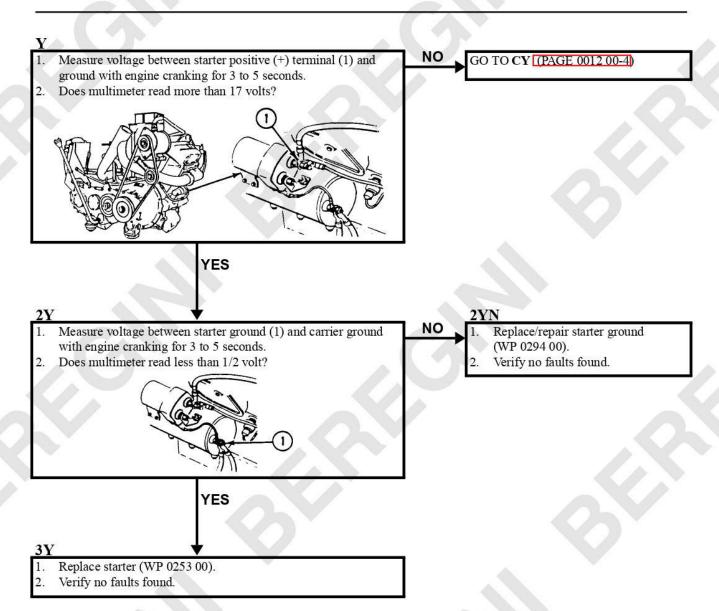
Engine stopped (see your -10)
Carrier blocked (see your -10)
Driver's seat raised (see your -10)

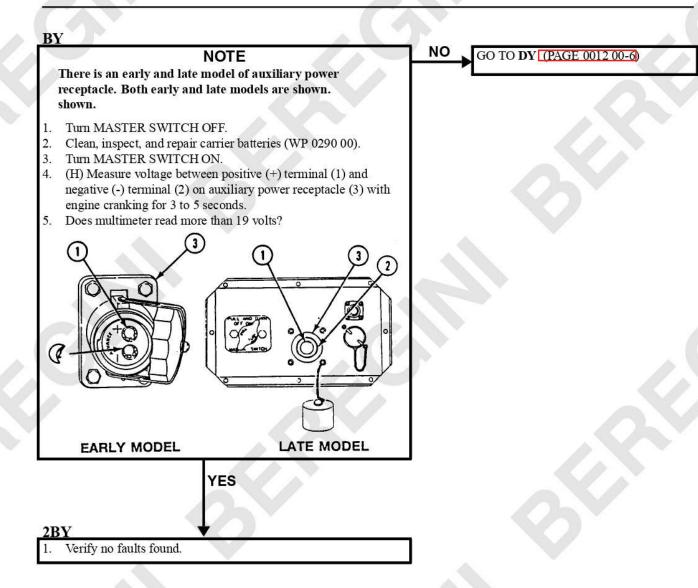
Power plant rear access door removed (see your -10)

Center seat raised (see your -10)

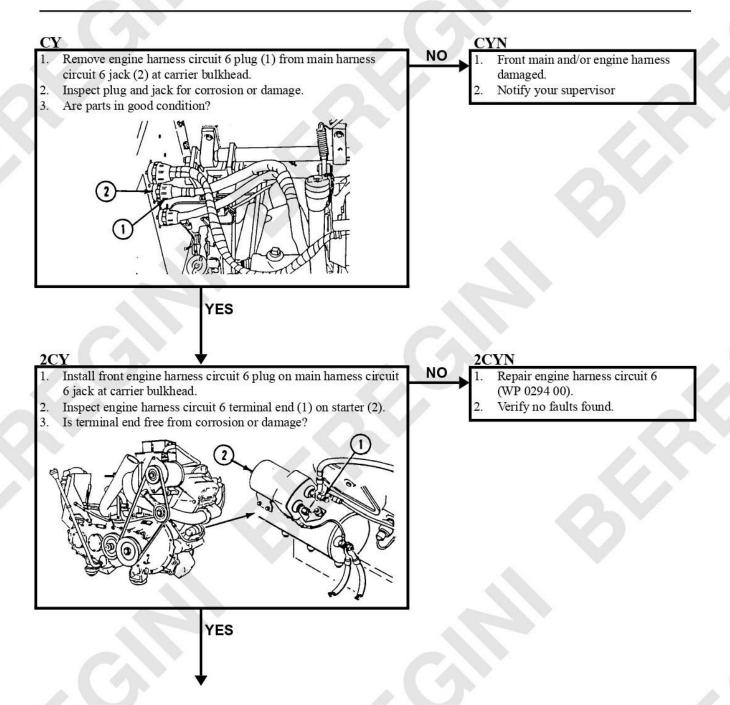


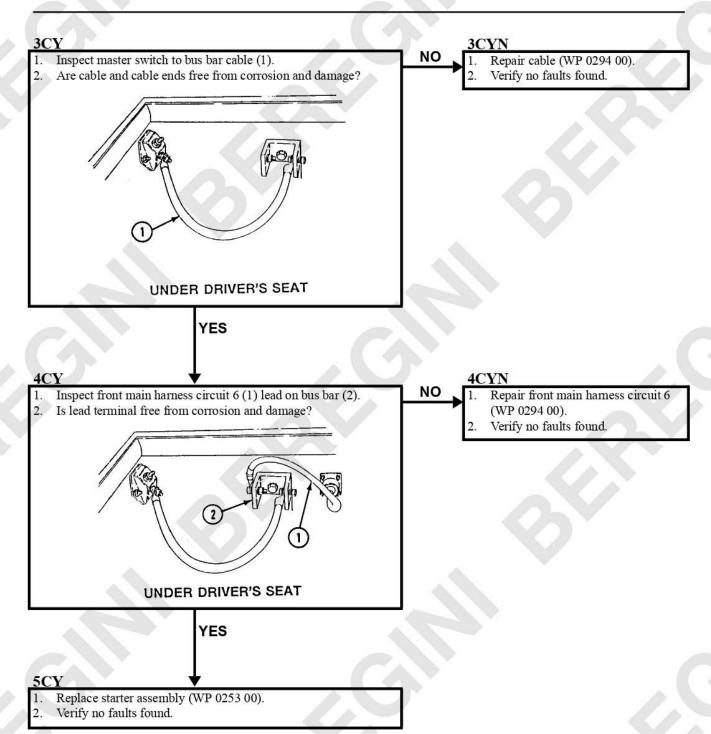
ENGINE CRANKS SLOWLY (M548A1)—Continued



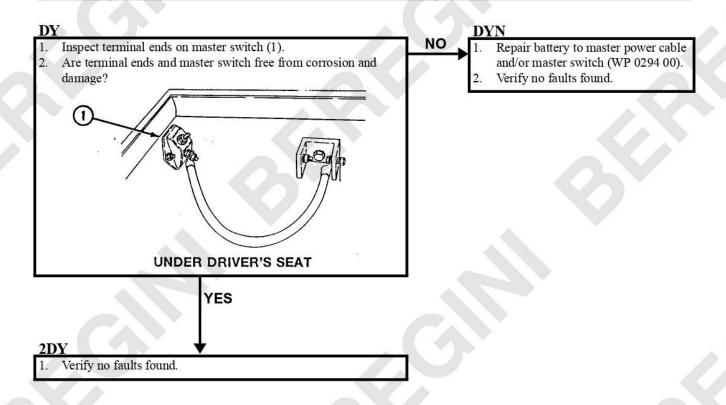


ENGINE CRANKS SLOWLY (M548A1)—Continued





ENGINE CRANKS SLOWLY (M548A1)—Continued



ENGINE CRANKS SLOWLY (M548A3)

0013 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic Helper (H)

References

See your -10

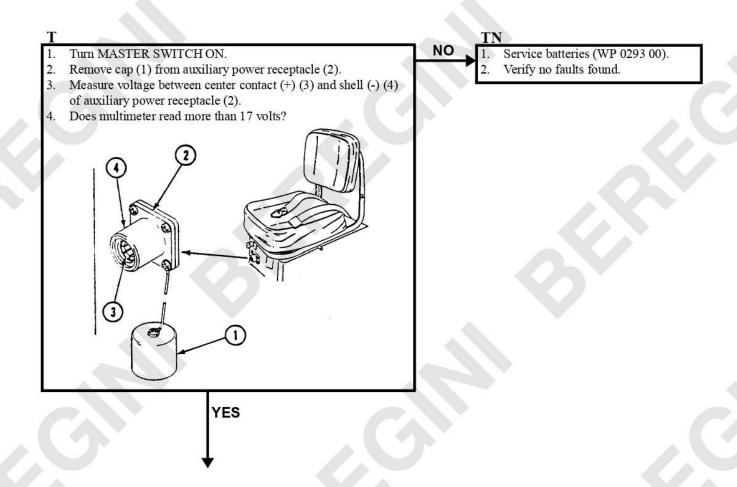
Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

Power plant rear access panel removed (see your -10)

Center and driver's seats raised (see your -10)

Hull bottom access cover removed (WP 0383 00)

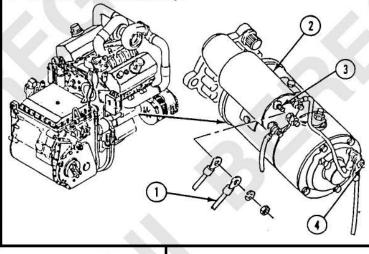


WARNING



Battery post and cables touched by metal objects can short circuit and burn you. Gas from batteries can explode and injure you. Battery acid can blind or burn you. Do not wear jewelry when you work on electrical systems. Use caution when you work near battery or electrical system with tools or other metal objects. Do not get acid on your skin or in your eyes. Do not allow sparks near batteries.

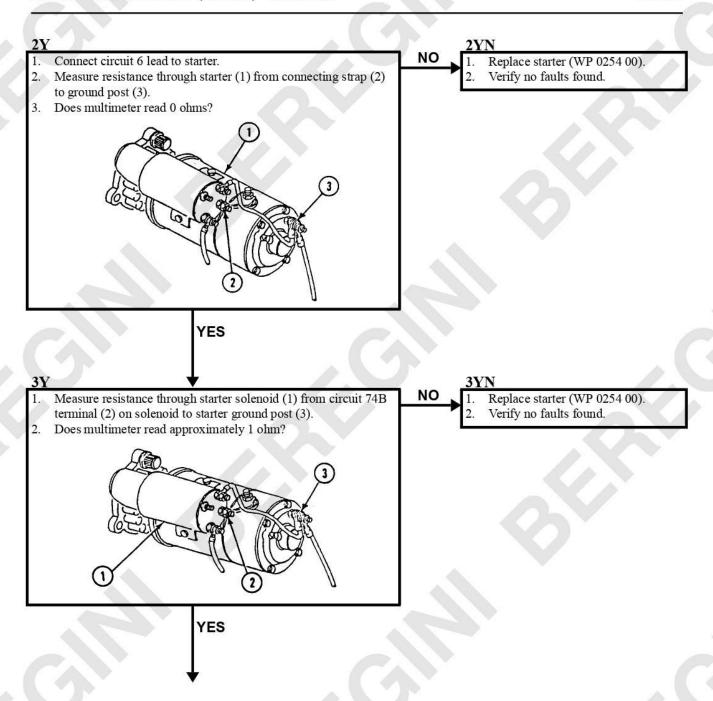
- 1. Disconnect batteries (WP 0292 00)
- 2. Disconnect circuit 6 lead (1) from starter solenoid (2).
- 3. Measure resistance from circuit 6 terminal (3) to ground (4).
- 4. Does multimeter read infinity?



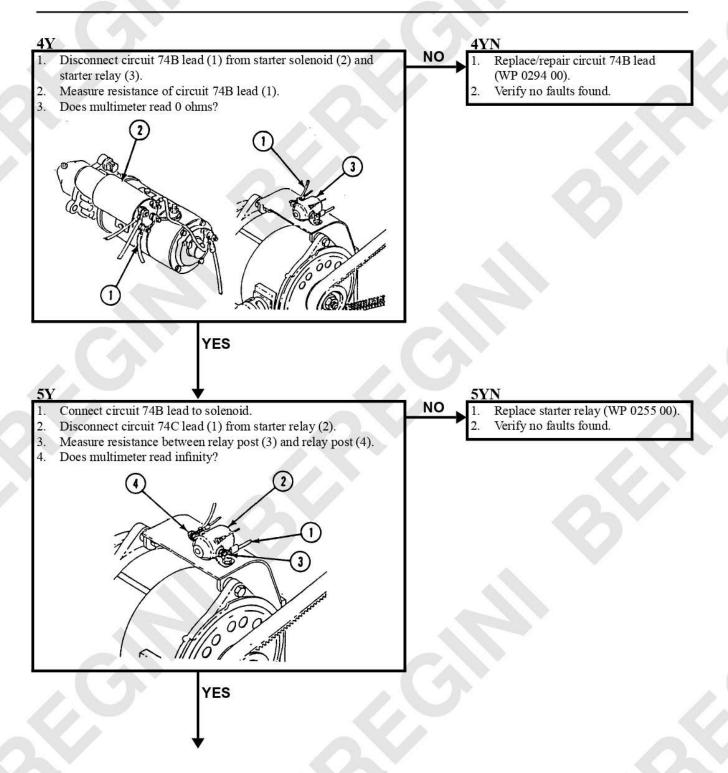
YES

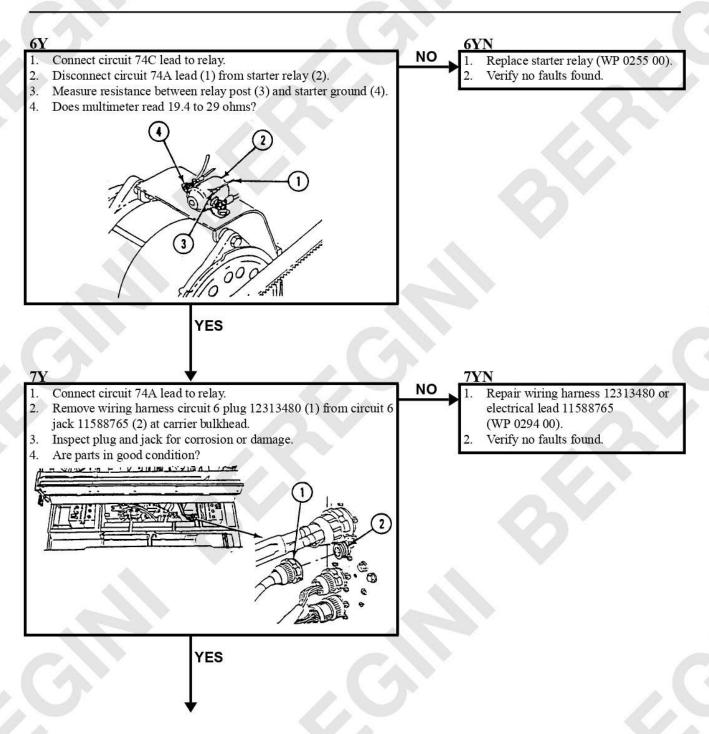
YN

- 1. Replace starter (WP 0254 00).
- . Verify no faults found.

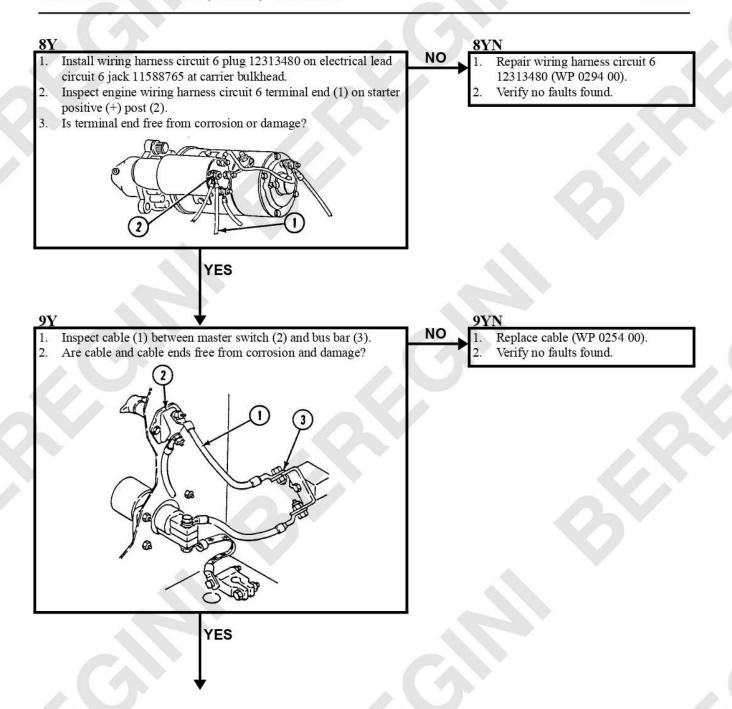


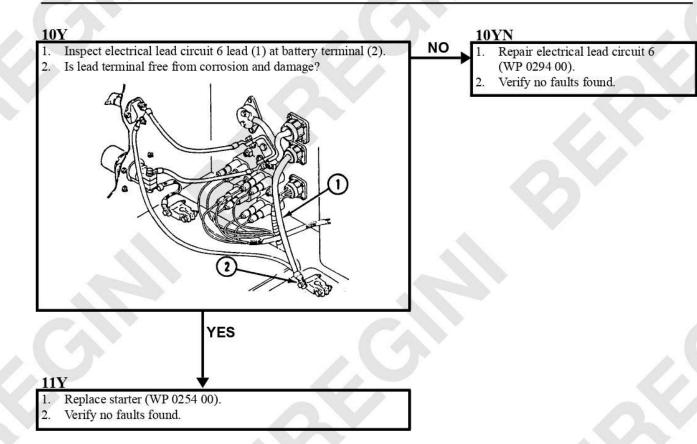
ENGINE CRANKS SLOWLY (M548A3)—Continued





ENGINE CRANKS SLOWLY (M548A3)—Continued







ENGINE CRANKS BUT WILL NOT START

0014 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6)

Materials/Parts

Suitable container

Personnel Required

Unit Mechanic Helper (H) References

See your -10 (WP 0113 00)

Equipment Condition

Engine stopped (see your -10)

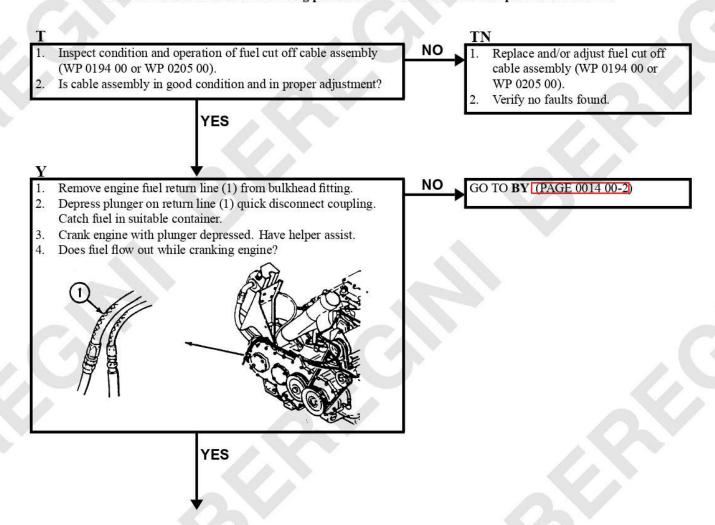
Carrier blocked (see your -10)

Power plant rear access door/panel removed

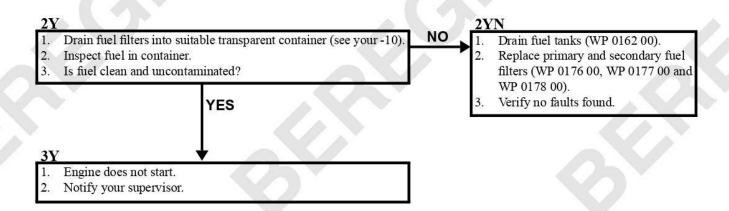
(see your -10)

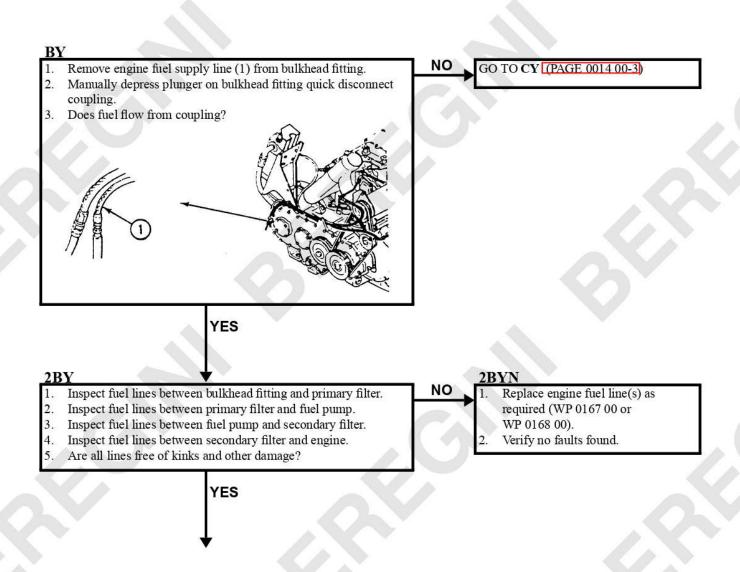
NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.



ENGINE CRANKS BUT WILL NOT START—Continued



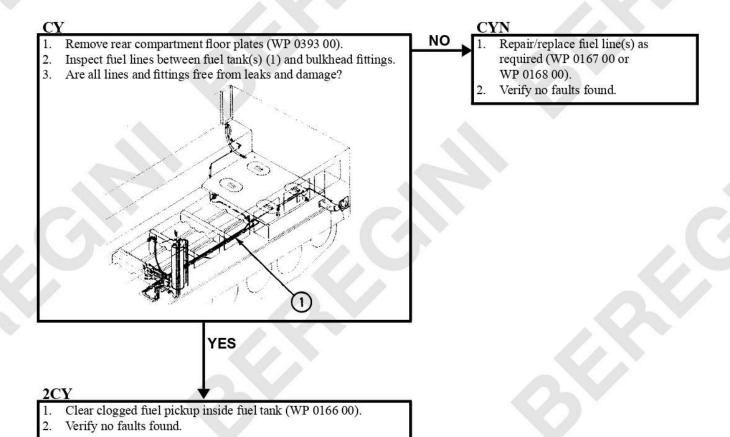


ENGINE CRANKS BUT WILL NOT START—Continued

0014 00

3BY

- 1. Replace fuel pump (WP 0149 00 or WP 0150 00).
- 2. Verify no faults found.





ENGINE CRANKS BUT WILL NOT START BELOW 40° F (AIR BOX HEATER IS USED)

0015 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

Helper (H)

References

See your -10 WP 0113 00

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

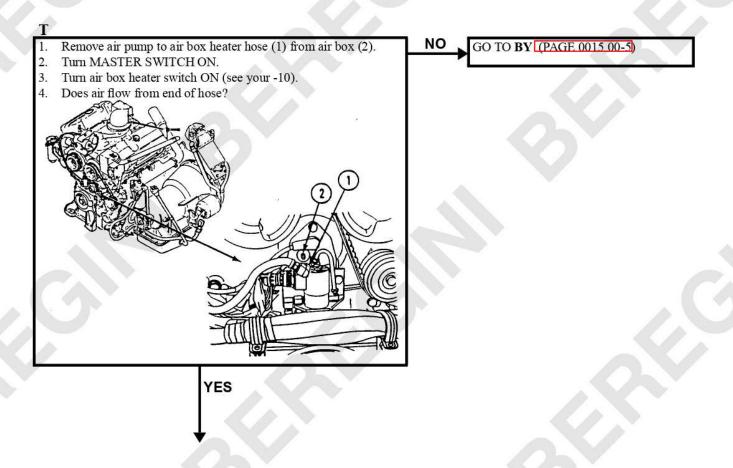
Cab personnel seats raised (see your -10)

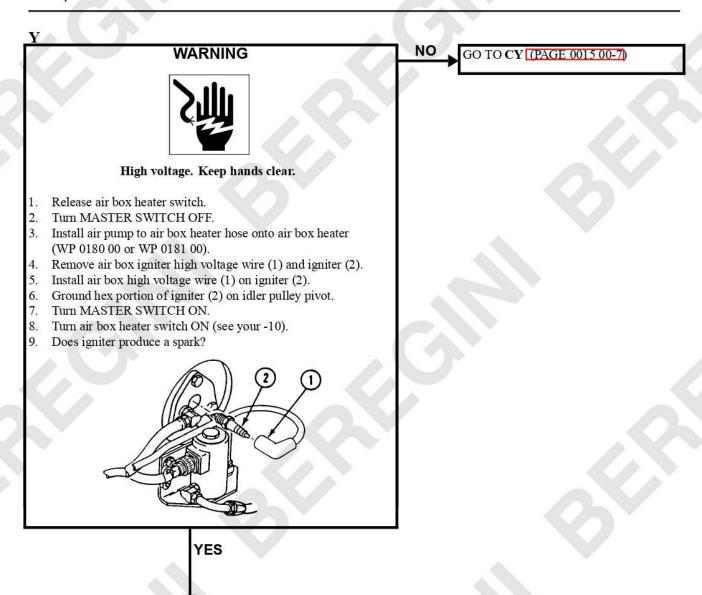
Power plant rear access door/panel removed

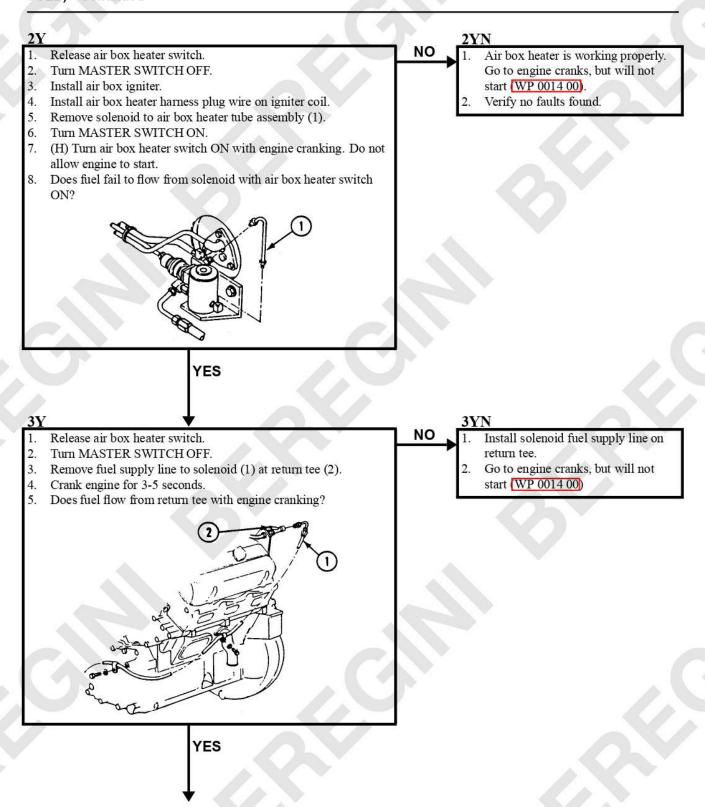
(see your -10)

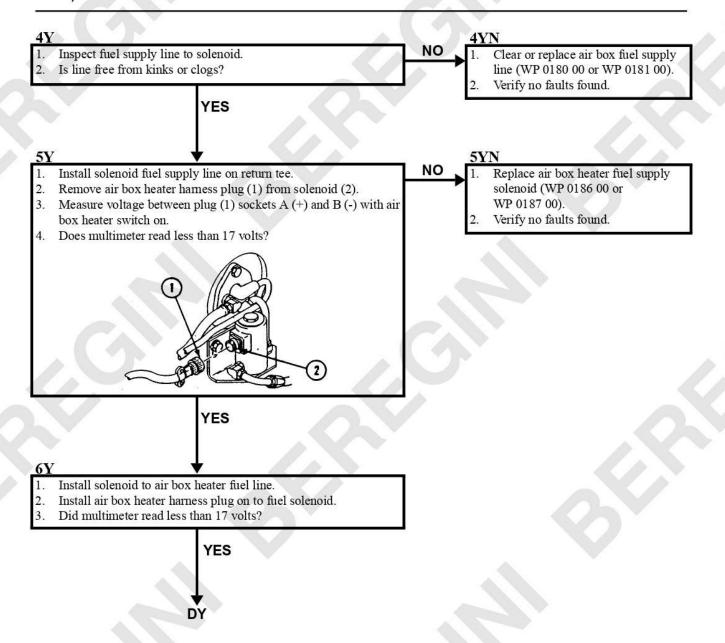
NOTE

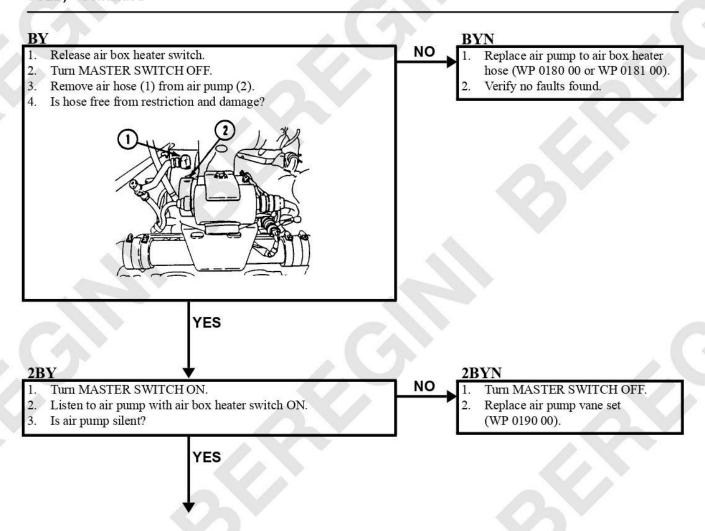
M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

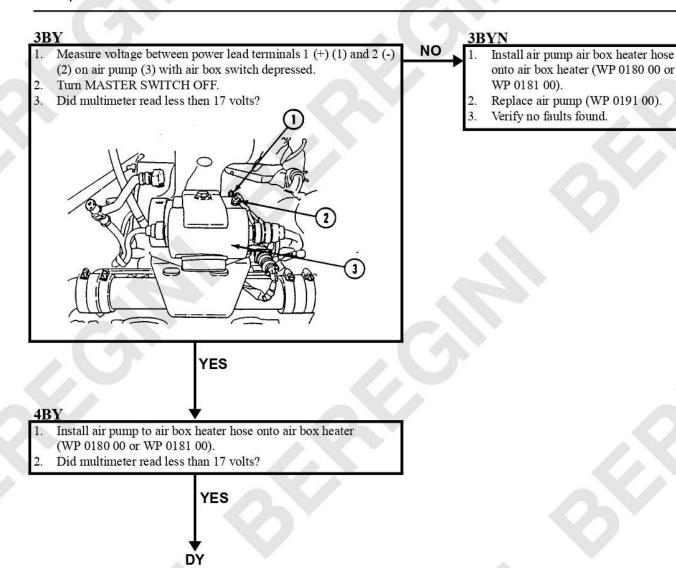


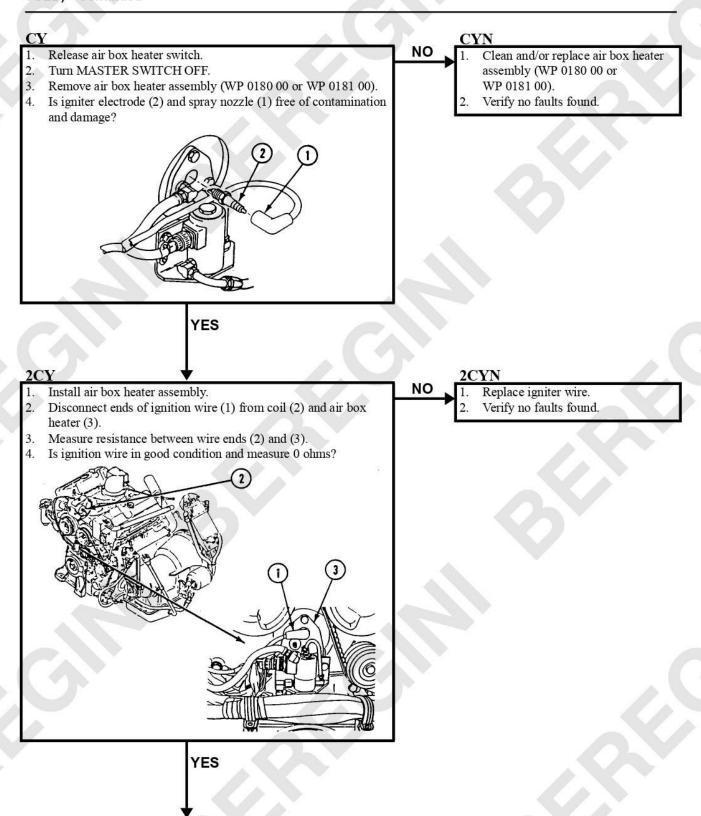


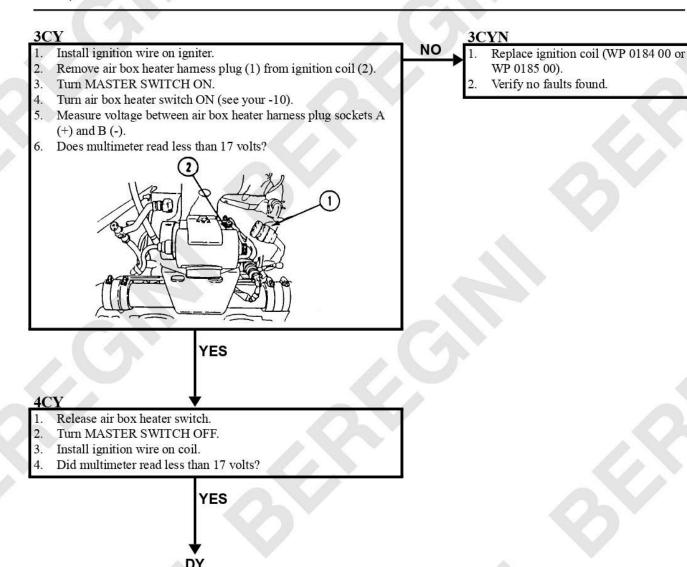


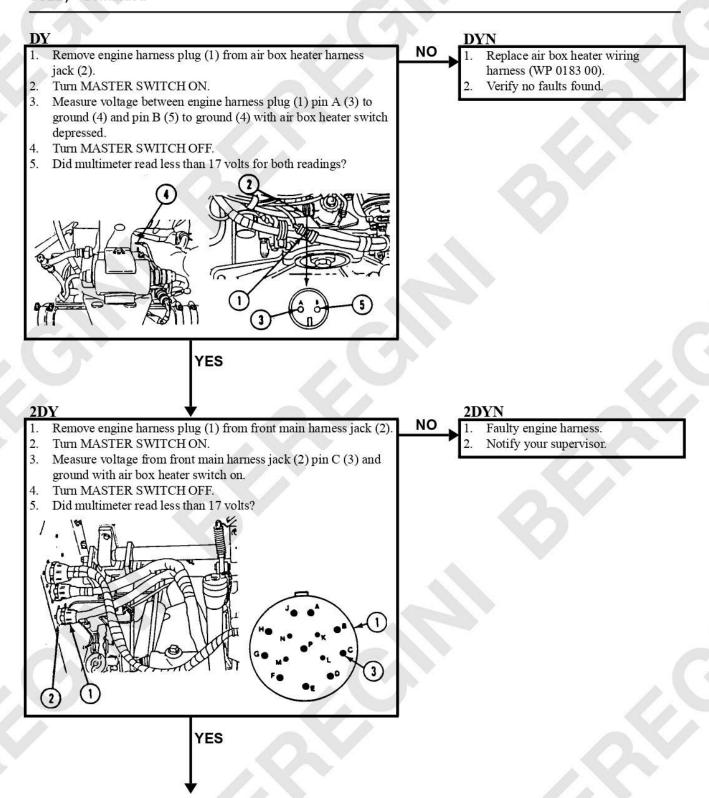


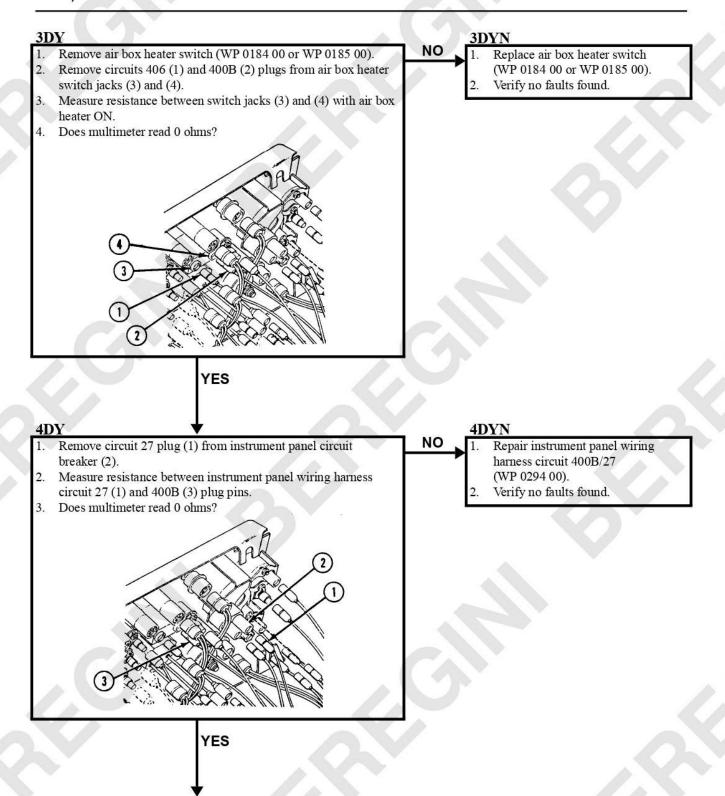












001500

5DY

- 1. Repair front main harness circuit 406 (WP 0294 00).
- 2. Verify no faults found.



0016 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Wiping rag (WP 0542 00, Item 45)

Suitable container

Personnel Required

Unit Mechanic

Helper (H)

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Air cleaner element cleaned (see your -10)

Primary and secondary fuel filters serviced

(see your -10)

Power plant rear access door removed

(see your -10)

T

WARNING



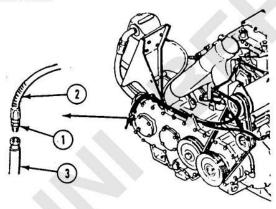
Fuel flowing over a metal surface causes static electricity. This will cause a spark unless the surface is grounded.

WARNING

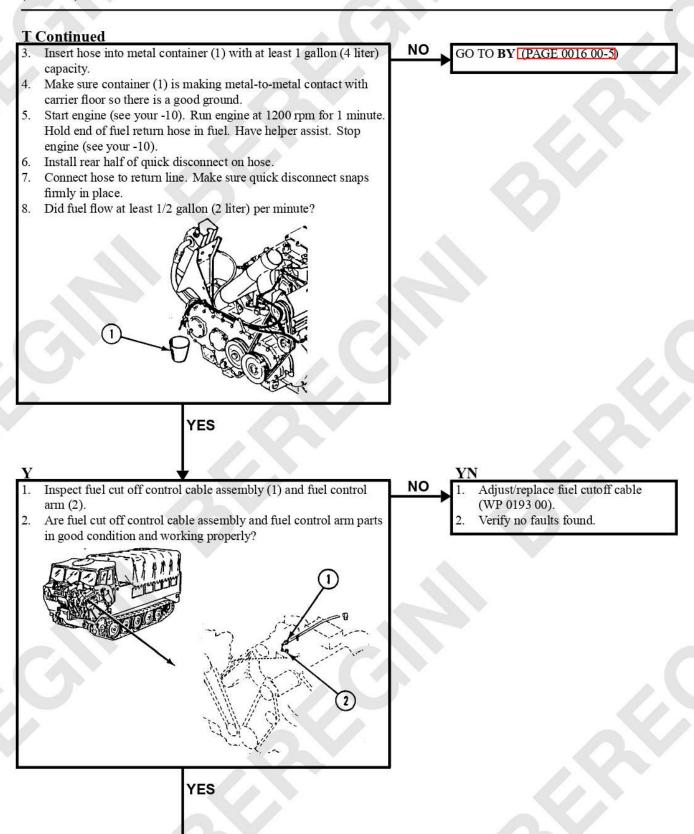


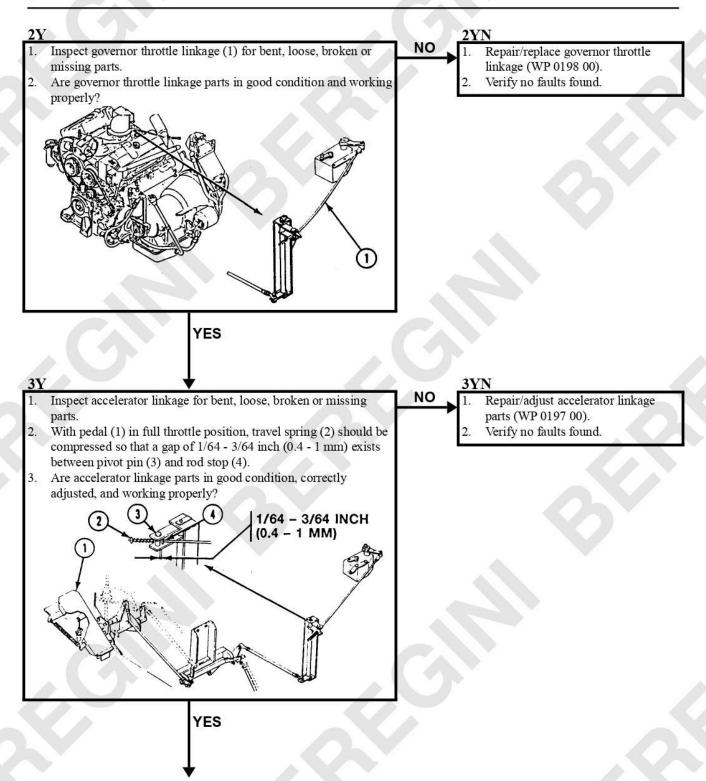
Loose clothing is dangerous around moving belts and pulley. You could get badly hurt if your clothes get caught in moving parts.

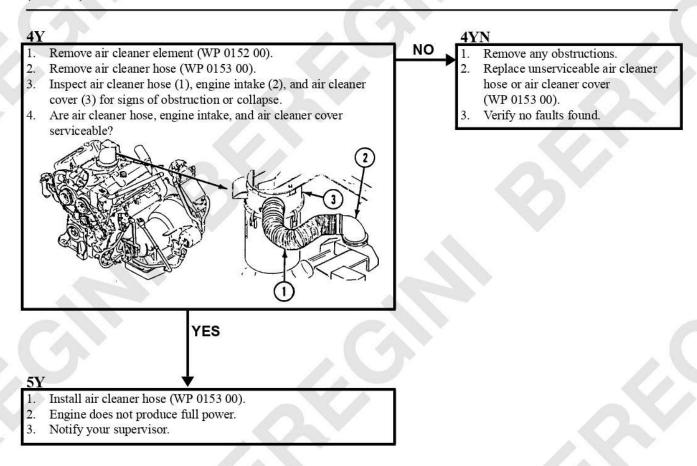
- 1. Push forward on quick disconnect coupling (1) to disconnect return hose (2) from fuel return line (3).
- 2. Remove half of quick disconnect coupling (1) from return hose (2) and retain.

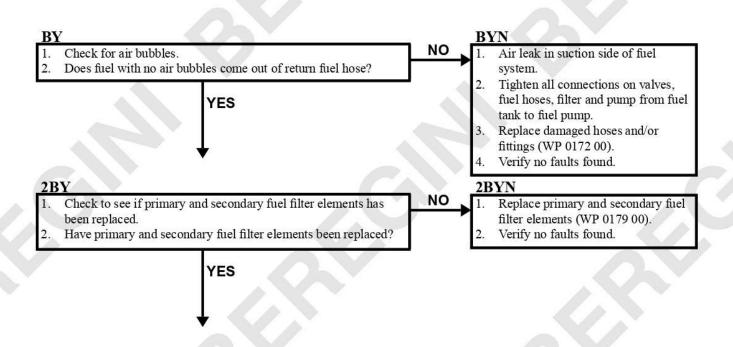


Continued





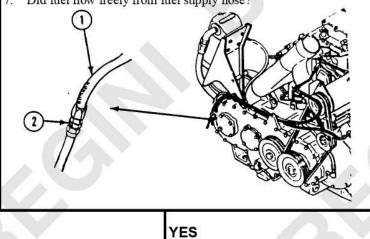




001600

3BY

- 1. Pull fuel supply hose (1) from quick disconnect coupling (2) in power plant compartment.
- Place wiping rags under fuel supply hose quick disconnect coupling (2).
- 3. Turn MASTER SWITCH ON.
- Depress plunger inside quick disconnect coupling (2) for about 5 seconds.
- Turn MASTER SWITCH OFF.
- 6. Connect fuel supply hose (1) to quick disconnect coupling (2).
- 7. Did fuel flow freely from fuel supply hose?



4BY

- Replace engine fuel pump (WP 0149 00).
- 2. Verify no faults found.

3BYN

NO

- Fuel supply hose or fuel tank pickup tube obstructed.
- Replace obstructed fuel lines (WP 0167 00).
- Verify no faults found.

0017 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Wiping rag (WP 0542 00, Item 45)

Suitable container

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat and driver's seat raised (see your -10)

Air cleaner element cleaned (WP 0155 00)

Hull bottom access cover removed (WP 0383 00)

Primary and secondary fuel filters serviced

(WP 0178 00)

Power plant rear access panel removed (see your -10)

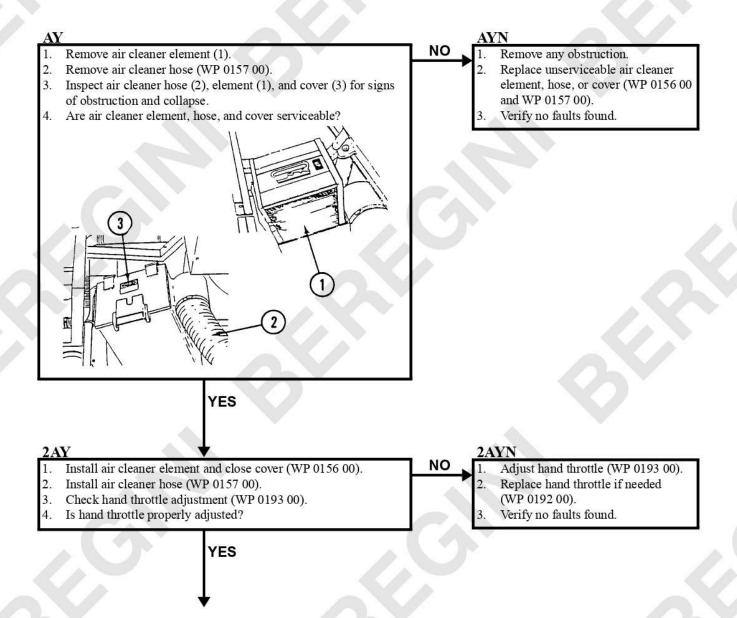
Top left access grille removed (see your -10)

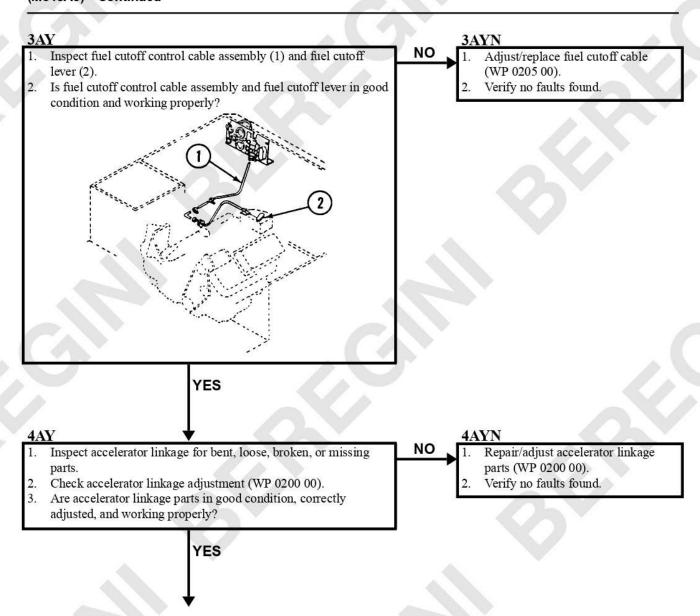
1. Turn MASTER SWITCH ON. 2. Place suitable container under primary fuel filter (1). 3. Open drain cock (2) and drain water and sediment from primary fuel filter. 4. Close drain cock (2) when clean fuel comes out. 5. Place a suitable container under secondary fuel filter drain hose (3). 6. Depress lever (4) and drain fuel from secondary fuel filter (5). 7. Check container for contaminated or improper fuel. 8. Turn MASTER SWITCH OFF. 9. Is contaminated or improper fuel being used?

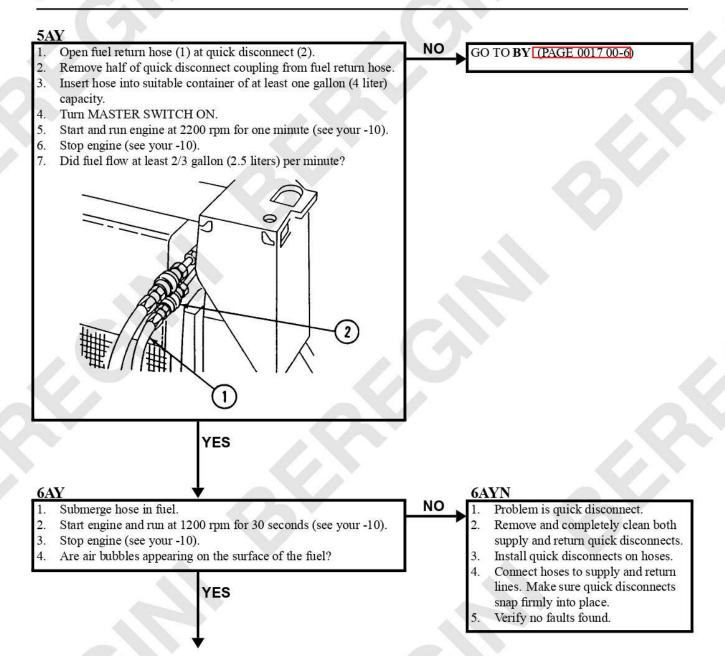
001700

V

- 1. Drain complete fuel system (WP 0162 00) and change filter elements (WP 0178 00).
- 2. Fill fuel tank with clean fuel (see your -10).
- 3. Verify no faults found.



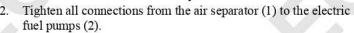


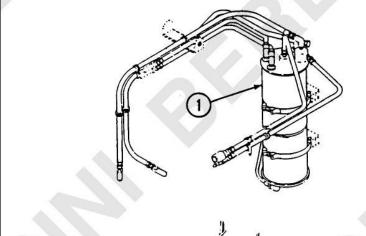


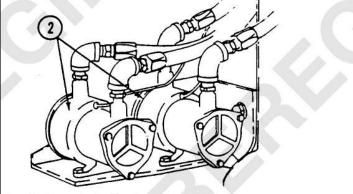
0017 00

7AY

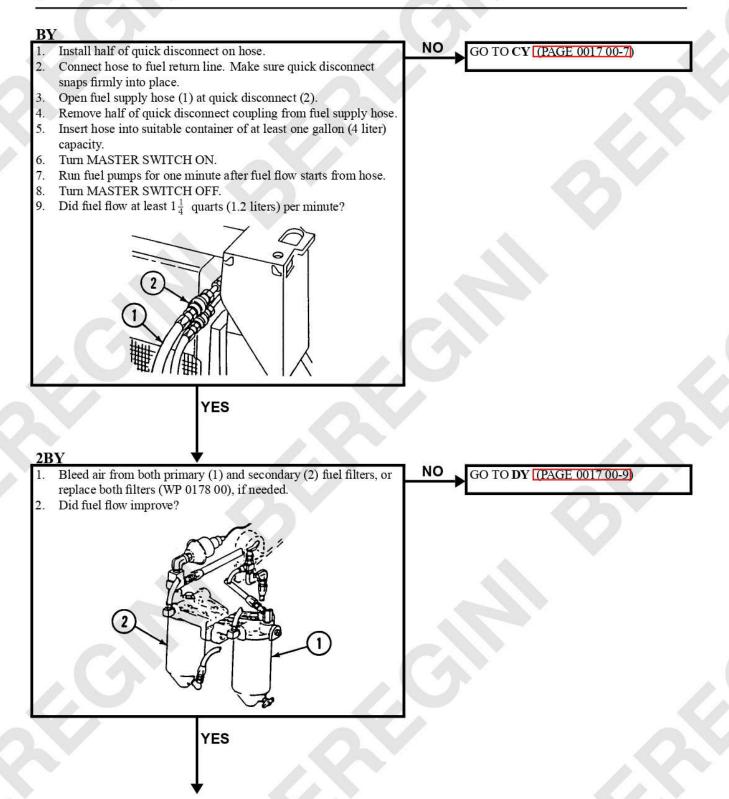
1. Air leak in suction side of fuel system.







3. Verify no faults found.



NO

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued

001700

3BY

- 1. Insert hose into suitable container of at least one gallon (4 liter) capacity.
- 2. Turn MASTER SWITCH ON.
- 3. Start and run engine at 1200 rpm for one minute (see your -10).
- 4. Stop engine (see your -10).
- 5. Did fuel flow at least 2/3 gallon (2.5 liters) per minute?

YES

4BY

- Problem was clogged fuel filters.
- 2. Verify no faults found.

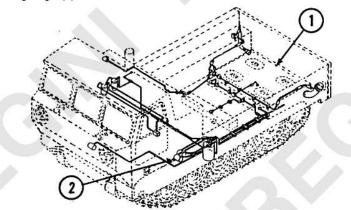


- Submerge hose in fuel.
- 2. Turn MASTER SWITCH ON
- 3. Run fuel pumps for 30 seconds.
- 4. Turn MASTER SWITCH OFF.
- 5. Are air bubbles appearing on the surface of the fuel?

YES

2CY

- 1. Air leak in suction side of fuel system.
- 2. Tighten all connections from the fuel tank (1) to electric fuel pumps (2).



Verify no faults found.

GO TO EY (PAGE 0017 00-10)

GO TO FY (PAGE 0017 00-8)

001700

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER

Install left rear and right forward fuel compartment access covers

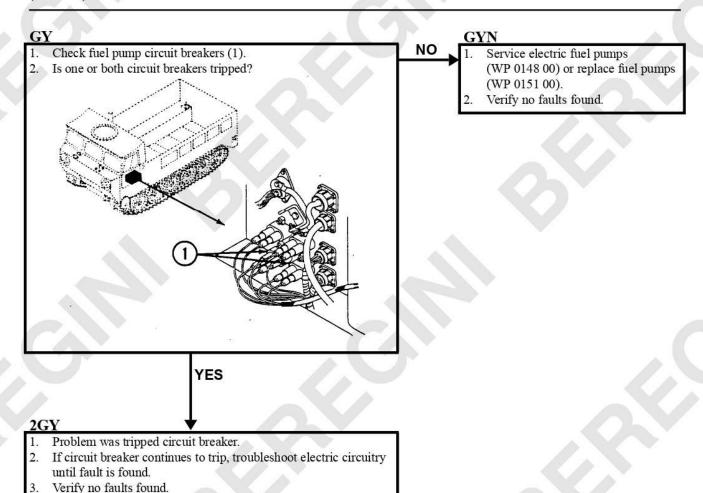
Tighten and/or replace fuel lines as needed (WP 0168 00).

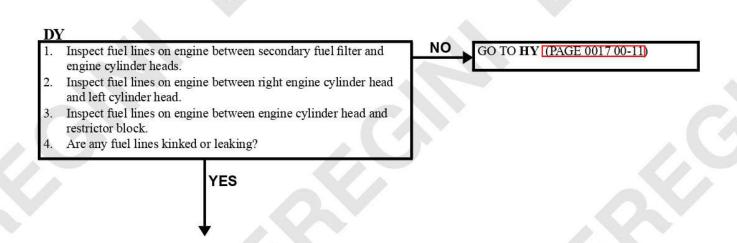
4FY

(WP 0163 00).

Verify no faults found.

(M548A3)—Continued Check and see if both electric fuel pumps are working. GO TO GY (PAGE 0017 00-9) Are both electric fuel pumps working? YES NO Flow test electric fuel pumps (WP 0148 00). Replace defective electric fuel pumps Is fuel flow from electric fuel pumps $1\frac{1}{2}$ to $2\frac{1}{2}$ quarts (1.4 to 2.4 (WP 0151 00). liters) per minute? Verify no faults found. YES 3FY NO Inspect fuel lines and connections. Internal fuel restriction. Beyond unit Tighten hose connections between fuel compartment and electric repair. fuel pumps if needed. Notify your supervisor. 3. Remove left rear and right forward fuel access covers (WP 0163 00). Clean screens at the end of each tube. Remove blockage from pickup tubes. Are any fuel lines kinked or leaking? YES





001700

2DY

- 1. Tighten and/or replace fuel lines as needed (WP 0168 00).
- 2. Verify no faults found.

EY

- Inspect fuel lines on engine between secondary fuel filter and engine cylinder heads.
- Inspect fuel lines on engine between right engine cylinder head and left cylinder head.
- Inspect fuel lines on engine between engine cylinder head and restrictor block.
- 4. Are any fuel lines kinked or leaking?

LYN 1. R

NO

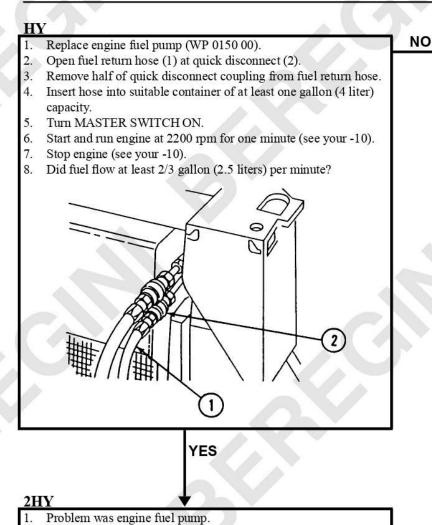
- Replace engine fuel pump (WP 0150 00).
- Verify no faults found.

YES

2EY

- 1. Tighten and/or replace fuel lines as needed (WP 0168 00).
- Verify no faults found.

001700



Verify no faults found.

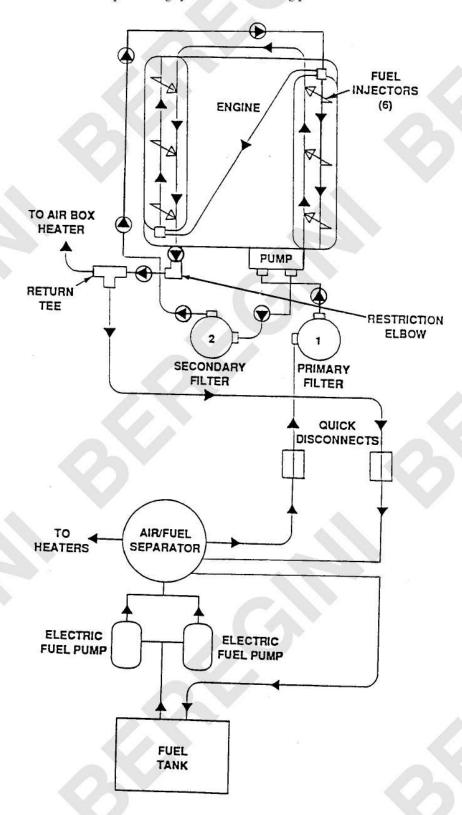
. Internal engine fuel restriction. Beyond unit repair.

. Notify your supervisor.



DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.

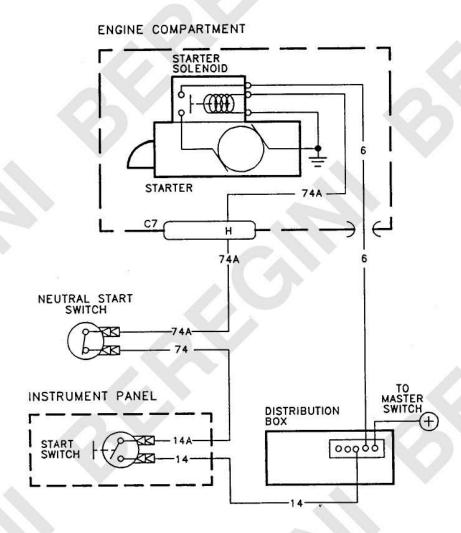


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DESCRIPTION

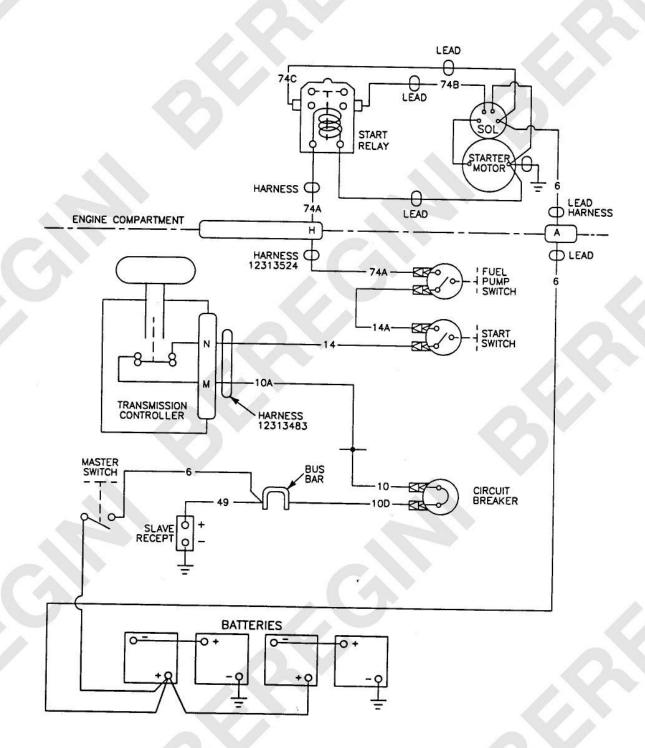
Use the schematic below as an aid for performing system troubleshooting procedures.





DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.

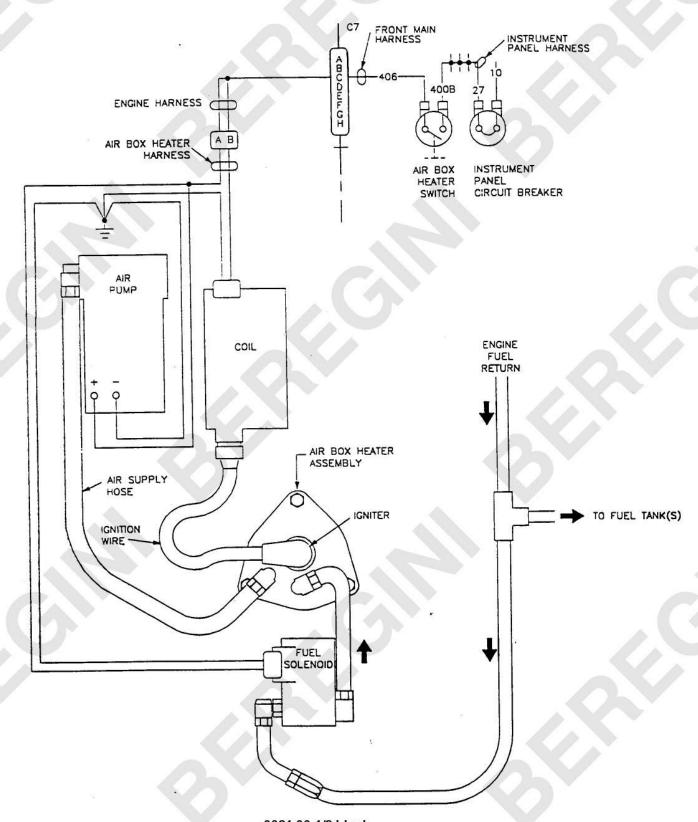




0021 00

DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.



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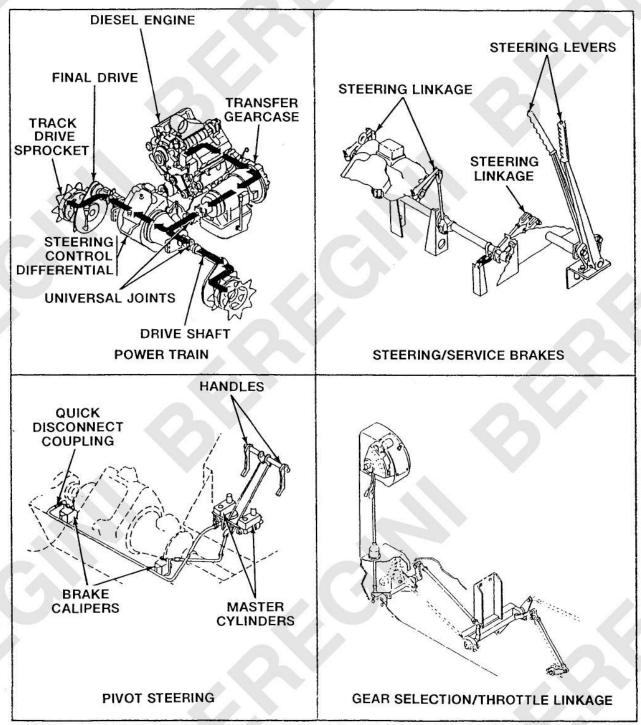


POWER TRAIN/STEERING/BRAKES/GEAR SELECTION/THROTTLE DIAGRAMS

0022 00

DESCRIPTION

Use the diagrams below as an aid for performing system troubleshooting procedures.



POWER TRAIN/STEERING/BRAKES/GEAR SELECTION/THROTTLE DIAGRAMS



100 AMP CHARGING SYSTEM MALFUNCTIONS (M548A1)

0023 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6) Multimeter (WP 0541 00, Item 29) Jumper Wire

Personnel Required

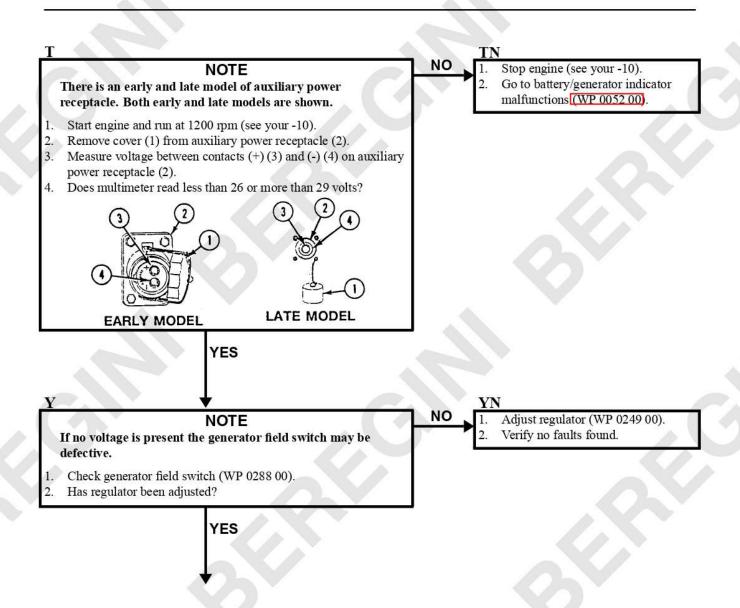
Unit Mechanic

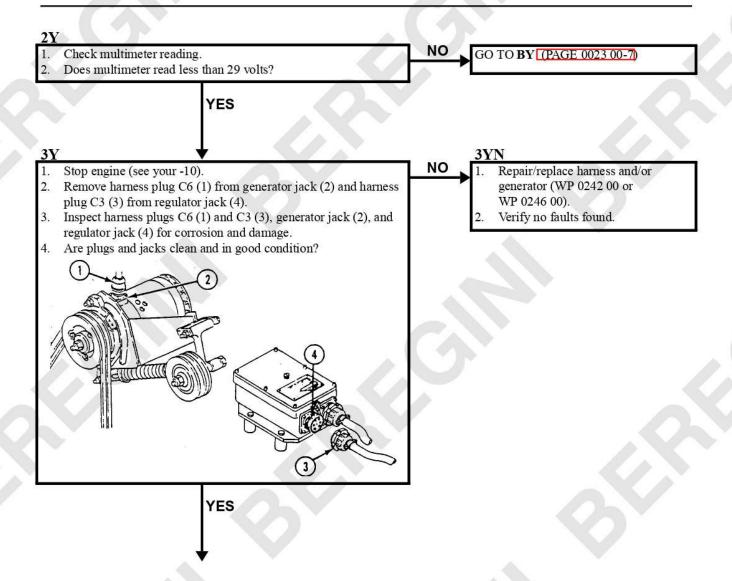
References

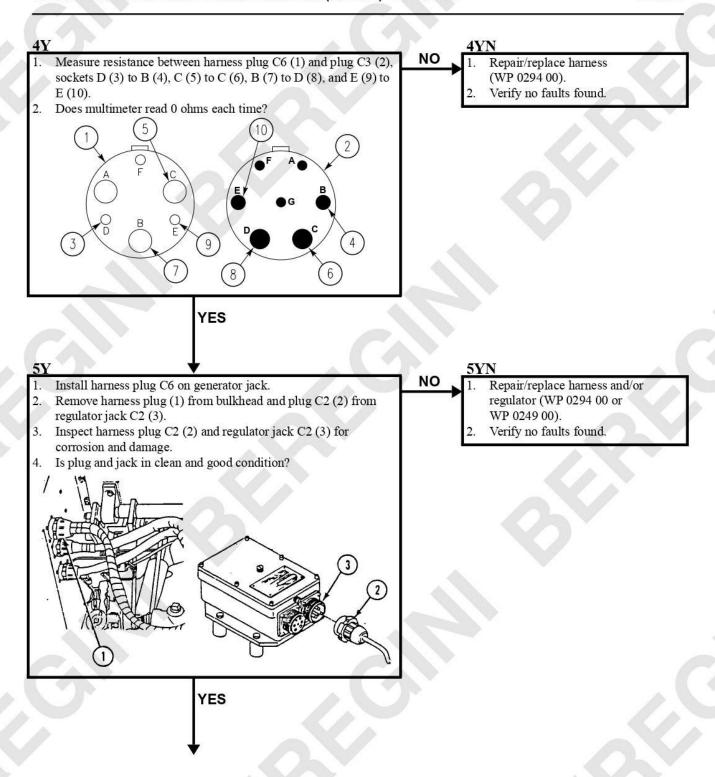
See your -10 WP 0108 00)

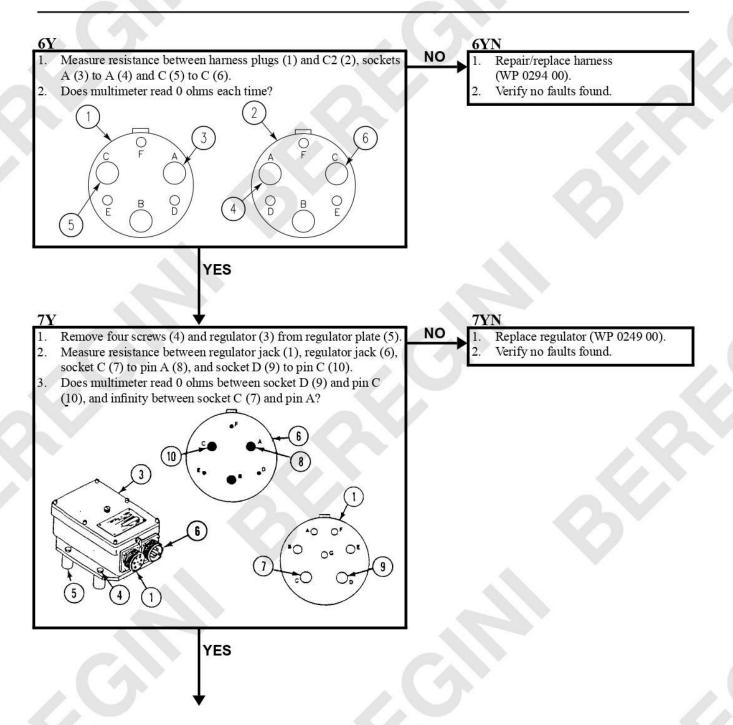
Equipment Condition

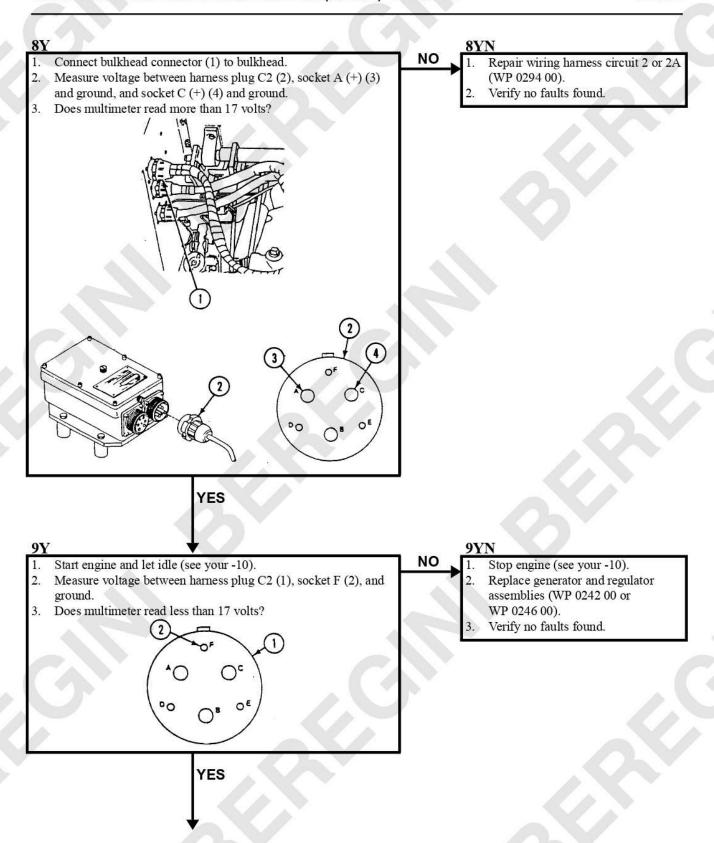
Engine stopped (see your -10)
Carrier blocked (see your -10)
Engine disconnect lever IN (see your -10)
Power plant rear access door/panel removed (see your -10)
Cab personnel seats raised (see your -10)

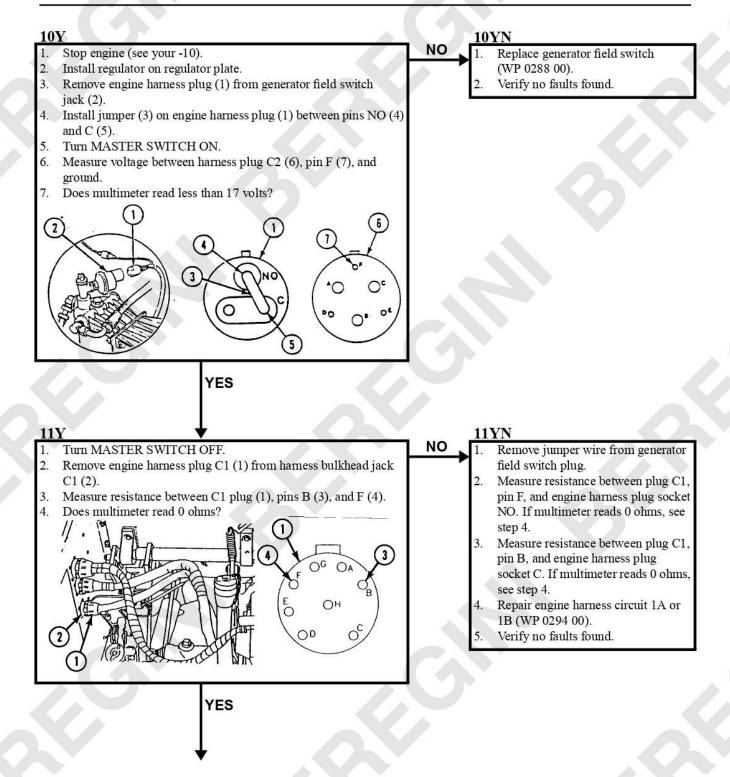


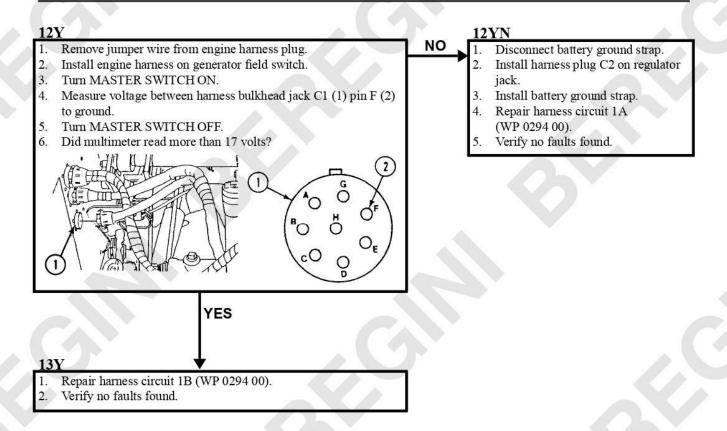


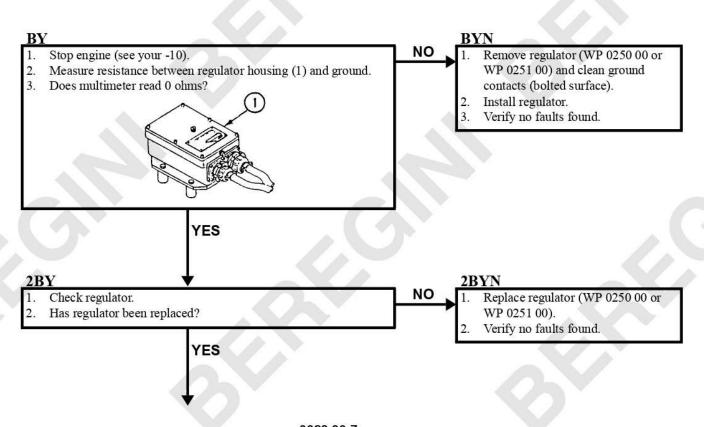












0023 00

3BY

- Replace generator (WP 0242 00 or WP 0246 00). Verify no faults found.

200 AMP CHARGING SYSTEM OPERATIONAL CHECK (M548A3)

0024 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

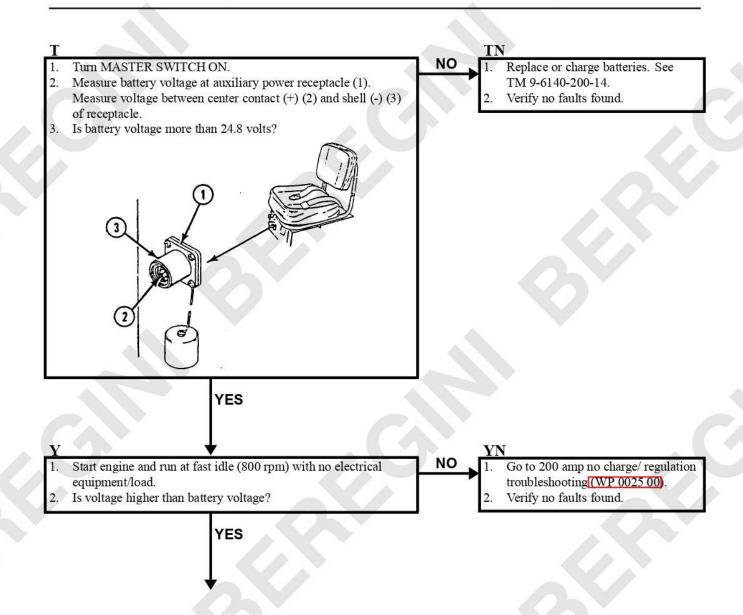
References

See your -10 TM 9-6140-200-14

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)



200 AMP CHARGING SYSTEM OPERATIONAL CHECK (M548A3)—Continued 002400 Check voltage. GO TO BY (PAGE 0024 00-2) Is voltage 27.5 or higher? YES 3Y GO TO CY (PAGE 0024 00-3) CAUTION If voltage is 35 or more volts, shut off engine. Generator could be damaged. Raise engine speed slowly. Is voltage between 27.5 and 28.5 volts? YES NO Run engine at 900 rpm and turn on electrical equipment (lights Go to 200 amp no charge/ regulation troubleshooting (WP 0025 00). Does voltage vary less than \pm 0.5 volts? Verify no faults found. YES Verify no faults found. BYN Adjust voltage regulator setting (WP 0249 00). NO Go to 200 amp no charge/ regulation troubleshooting (WP 0025 00). Start engine and run at fast idle (800 rpm) with no electrical Verify no faults found. equipment/load. Is voltage higher than battery voltage? YES

Verify no faults found.

200 AMP CHARGING SYSTEM OPERATIONAL CHECK (M548A3)—Continued 002400 NO Raise engine speed slowly. Replace voltage regulator Is voltage below 34 volts? (WP 0251 00). Verify no faults found. YES NO Check voltage. GO TO DY (PAGE 0024 00-3) Does voltage climb to 32 to 34 volts and immediately drop to battery voltage? YES Go to 200 amp over voltage troubleshooting (WP 0027 00). Verify no faults found. NO Check voltage. Go to 200 amp over voltage Does voltage climb above 28.5 volts but below 33 volts and troubleshooting (WP 0027 00). remain constant? Verify no faults found. YES Go to 200 amp full field charge troubleshooting (WP 0026 00).

Verify no faults found.



200 AMP NO CHARGE/REGULATION TROUBLESHOOTING (M548A3)

0025 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33) Generator Test Kit (WP 0541 00, Item 53)

Personnel Required

Unit Mechanic

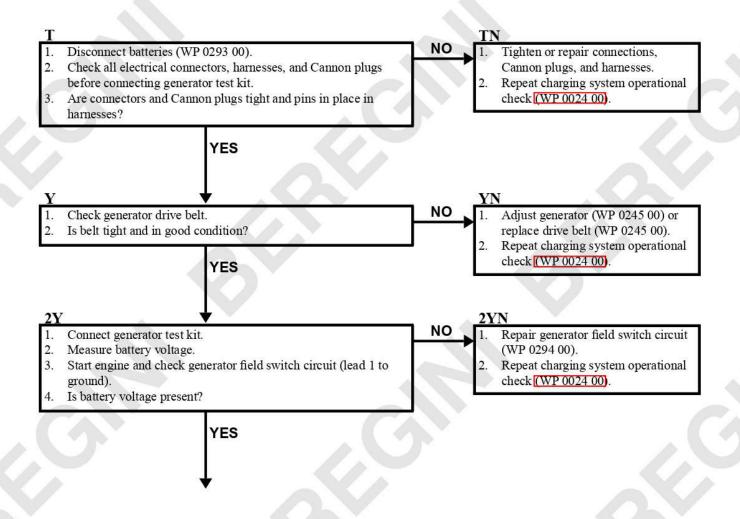
References

See your -10 TM 9-6140-200-14

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

All radios and heaters OFF (see your -10)



200 AMP NO CHARGE/REGULATION TROUBLESHOOTING (M548A3)—Continued

0025 00

3Y

CAUTION

If voltage climbs above 33 or more volts, shut off engine. Generator could be damaged.

- Check batteries to make sure they are fully charged TM 9-6140-200-14.
- 2. Turn off all electrical equipment/loads.
- 3. Adjust rheostat to maximum resistance.
- 4. Connect diagnostic test hamess leads 1 and 4 together.
- 5. Start engine and run at 800 rpm and lower resistance.
- 6. Does voltage rise above battery voltage (test harness lead 3 to ground) to approximately 28 volts?

YES

4Y

- Disconnect generator test kit.
- Replace voltage regulator (200 amp generator) (WP 0251 00).
- 3. Repeat charging system operational check (WP 0024 00).

NO \int_{1}^{3Y}

- . Disconnect generator test kit.
- Replace generator (200 amp) (WP 0246 00).
- Repeat charging system operational check (WP 0024 00).

200 AMP FULL FIELD CHARGE TROUBLESHOOTING (M548A3)

0026 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33) Generator Test Kit (WP 0541 00, Item 53)

Personnel Required

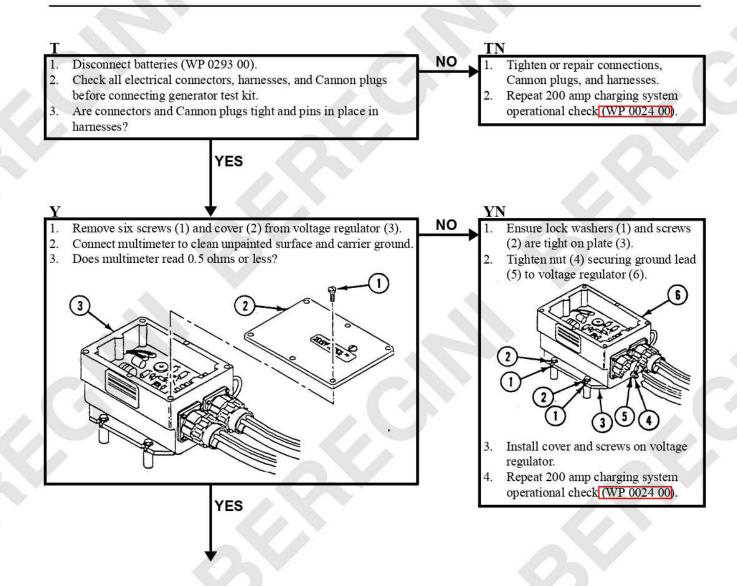
Unit Mechanic

Equipment Condition

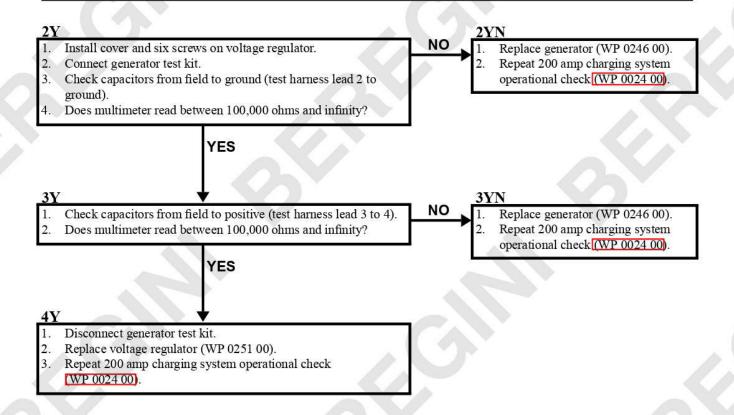
Engine stopped (see your -10)

Carrier blocked (see your -10)

All radios and heaters OFF (see your -10)



200 AMP FULL FIELD CHARGE TROUBLESHOOTING (M548A3)—Continued



200 AMP OVER VOLTAGE TROUBLESHOOTING (M548A3)

0027 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Generator Test Kit (WP 0541 00, Item 53)

Personnel Required

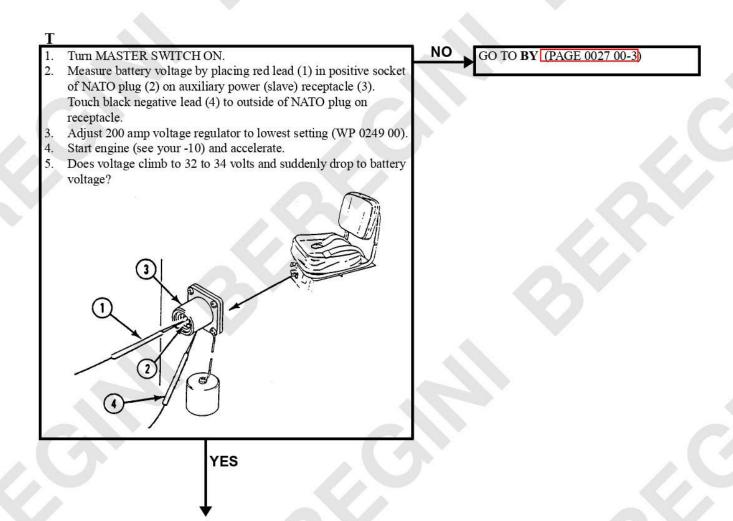
Unit Mechanic

References

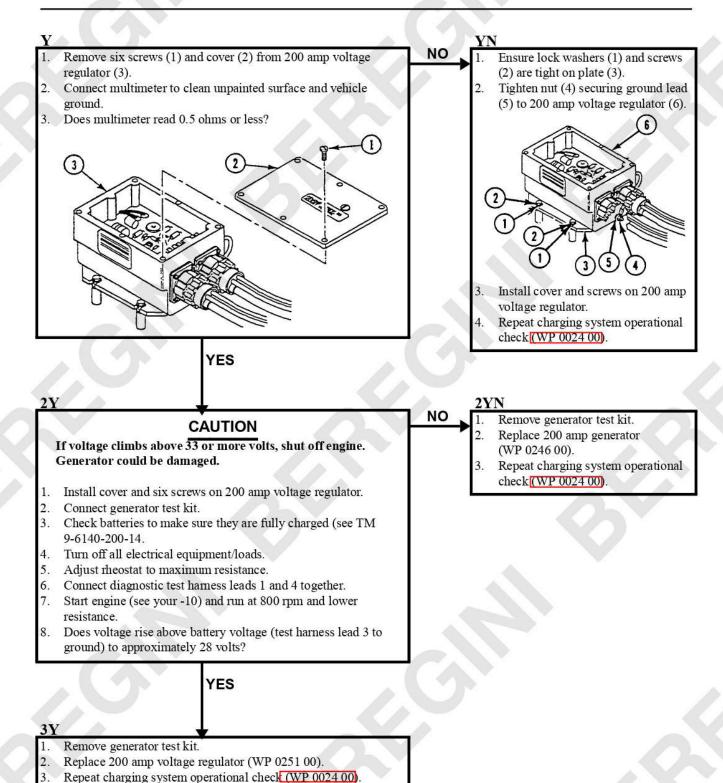
See your -10 TM 9-6140-200-14

Equipment Condition

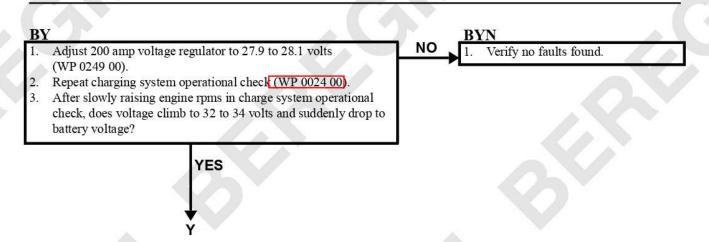
Engine stopped (see your -10) Carrier blocked (see your -10)



200 AMP OVER VOLTAGE TROUBLESHOOTING (M548A3)—Continued



200 AMP OVER VOLTAGE TROUBLESHOOTING (M548A3)—Continued





CONNECT/DISCONNECT 200 AMP GENERATOR TEST KIT (M548A3)

0028 00

THIS WORK PACKAGE COVERS:

Hook-up (page 0028 00-2). Disconnect (page 0028 00-4).

INITIAL SETUP:

Maintenance Level

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Slip Joint Pliers (WP 0541 00, Item 33) Generator Test Kit (WP 0541 00, Item 53)

Personnel Required
Unit Mech 63T10

Equipment Condition

References

Engine stopped (see your -10) Carrier blocked (see your -10)

All radios and heaters turned off (see your -10) Center seat and driver's seat raised (see your -10)

CONNECT/DISCONNECT 200 AMP GENERATOR TEST KIT (M548A3)—Continued

0028 00

HOOK-UP

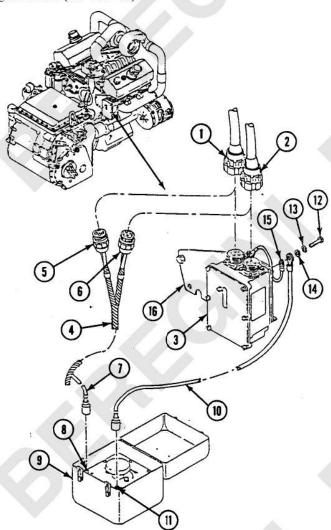
- 1. Disconnect both battery negative leads (WP 0292 00).
- 2. Check all electrical connectors and wiring harnesses before connecting generator test kit.
- 3. Remove plug (1) and plug (2) from voltage regulator (3).
- 4. Connect diagnostic test wiring harness (4) plug (5) and plug (6) to plug (1) and plug (2).
- 5. Connect diagnostic test wiring harness (4) lead 2(7) to terminal 5 (8) to test kit rheostat (9).

CAUTION

If ground lead (10) is not connected to chassis and kit rheostat, the generator could be damaged when engine is started.

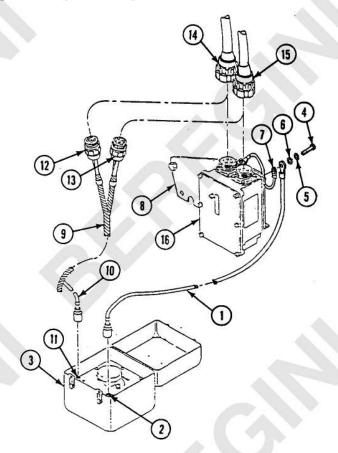
- 6. Connect kit ground lead (10) to terminal 6 (11) to test kit rheostat (9) and to ground.
 - a. Remove screw (12), lock washer(13), washer (14), and ground lead (15) from voltage regulator mounting plate (16).
 - b. Install ground lead (10) and ground lead (15) on voltage regulator mounting plate (16) with washer (14), lock washer (13) and screw (12).

7. Connect both battery negative leads (WP 0292 00).



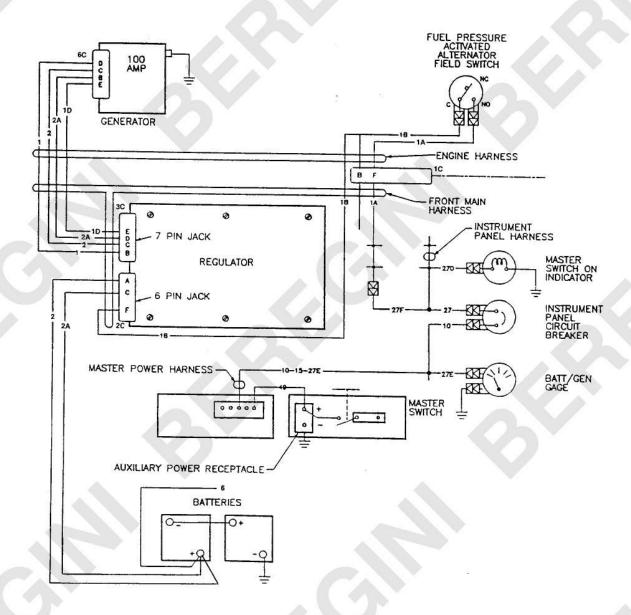
DISCONNECT

- 1. Disconnect both battery negative leads (WP 0292 00).
- 2. Disconnect ground lead (1) from terminal 6 (2) of test kit rheostat (3) and ground.
 - a. Remove screw (4), lock washer (5), washer (6), ground lead (1) and ground lead (7) from voltage regulator mounting plate (8).
 - b. Install ground lead (7) on voltage regulator mounting plate (8) with washer (6), lock washer (5), and screw (4).
- 3. Disconnect diagnostic test wiring harness (9) lead 2(10) from terminal 5 (11) of test kit rheostat (3).
- 4. Disconnect diagnostic test wiring harness (9) plug (12) and plug (13) from plug (14) and plug (15).
- 5. Connect plug (14) and plug (15) to voltage regulator (16).
- 6. Connect both battery negative leads (WP 0292 00).



DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.

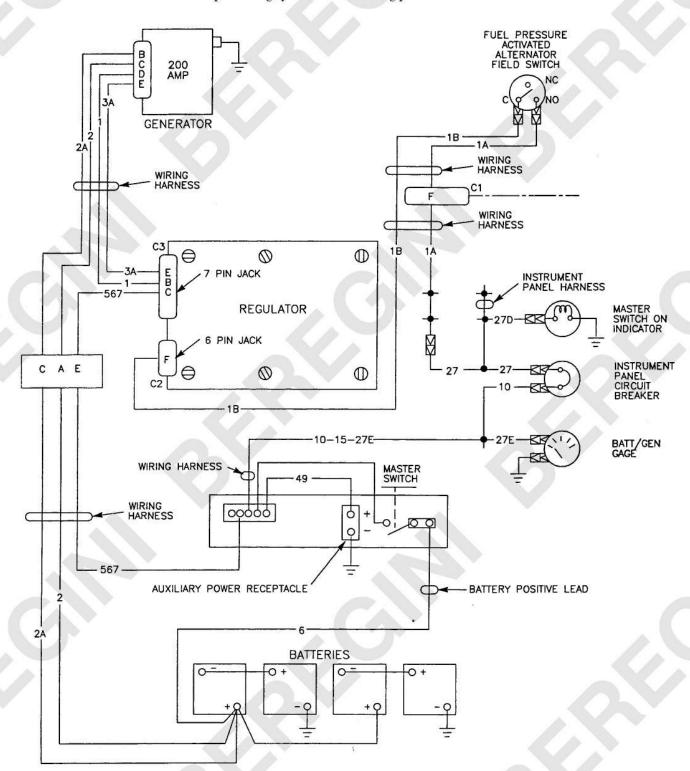




0030 00

DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.





HI TEMP DIFF OIL INDICATOR COMES ON (M548A1)

0031 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

See your -10

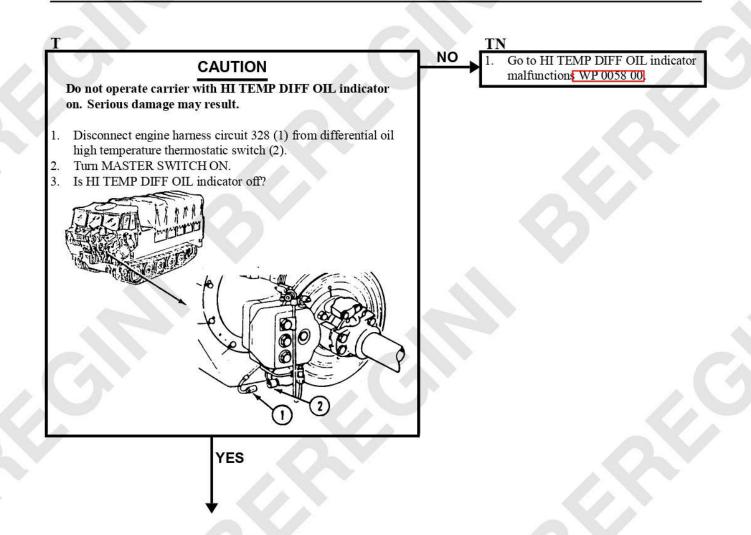
Equipment Condition

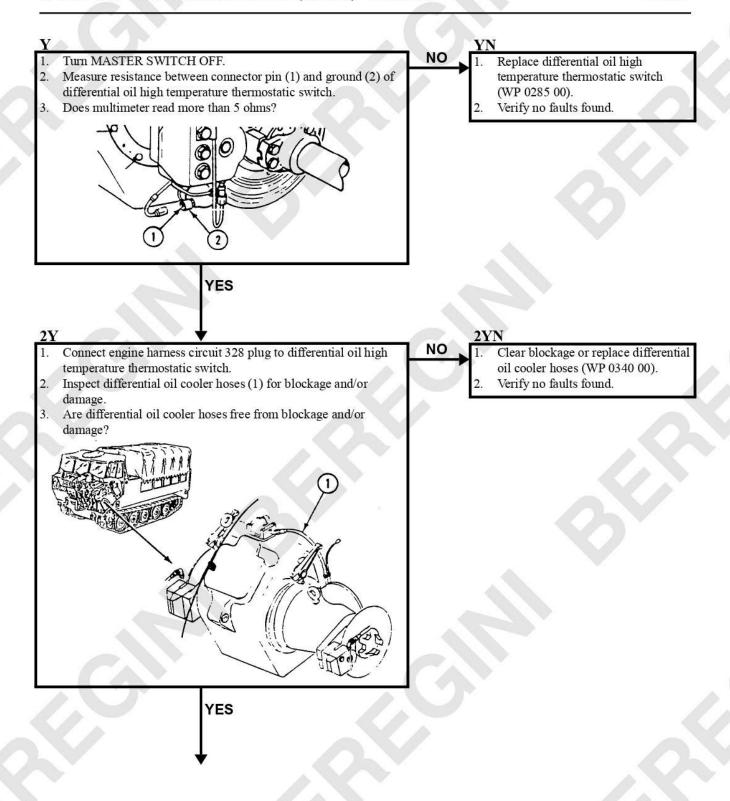
Engine stopped (see your -10)

Carrier blocked (see your -10)

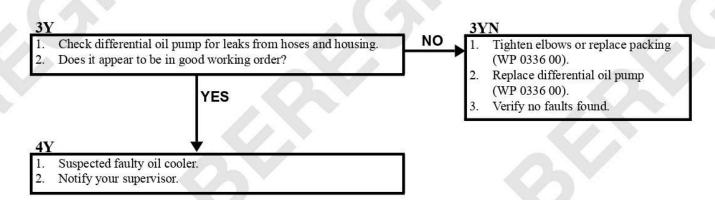
Center seat raised (see your -10)

Differential oil filter replaced (WP 0337 00)





HI TEMP DIFF OIL INDICATOR COMES ON (M548A1)—Continued





HI TEMP TRANS OIL INDICATOR COMES ON (M548A1)

0032 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

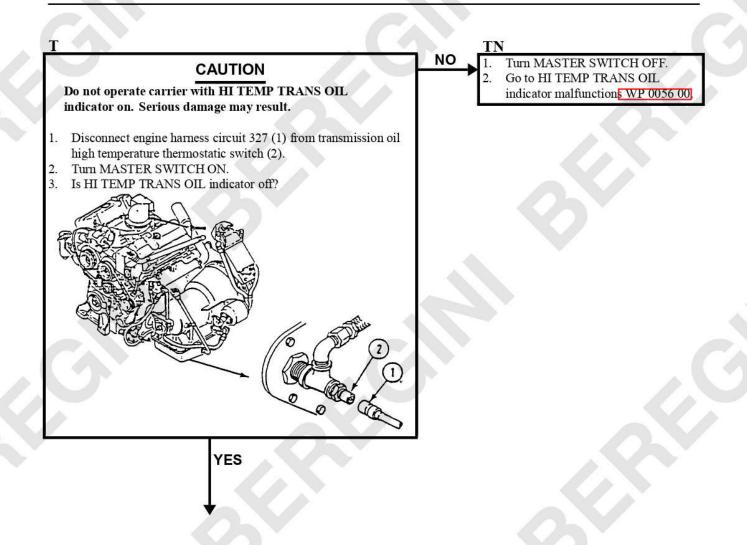
Equipment Condition

Engine stopped (see your -10)

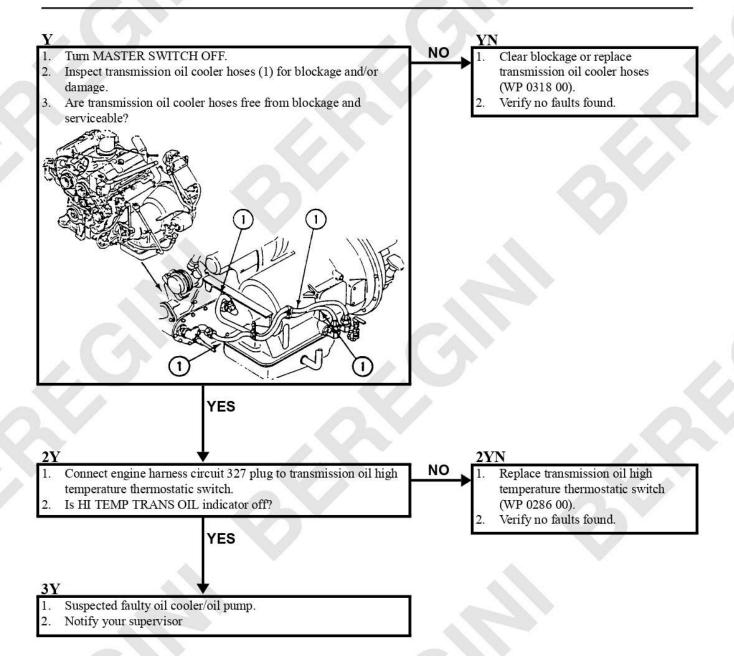
Carrier blocked (see your -10)

Center seat raised (see your -10)

Transmission oil filter element replaced (WP 0320 00).



HI TEMP TRANS OIL INDICATOR COMES ON (M548A1)—Continued



HI TEMP TRANS OIL INDICATOR COMES ON (M548A3)

0033 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

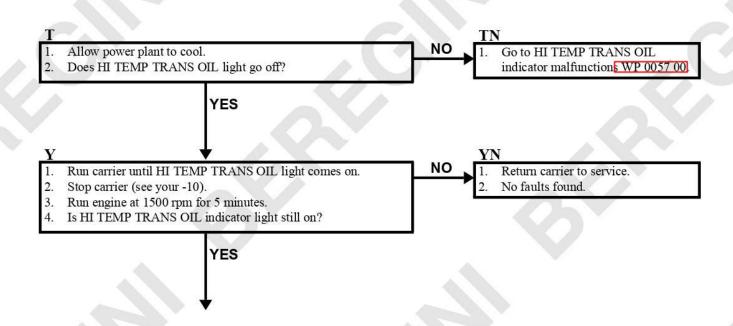
Unit Mechanic

References

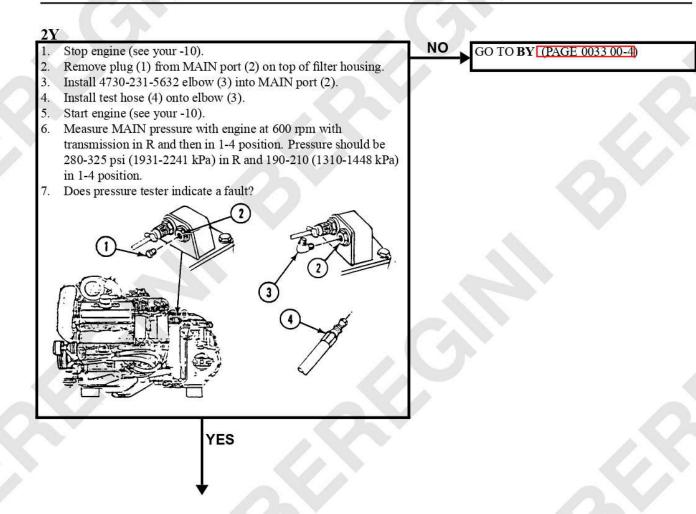
See your -10 See your PMCS

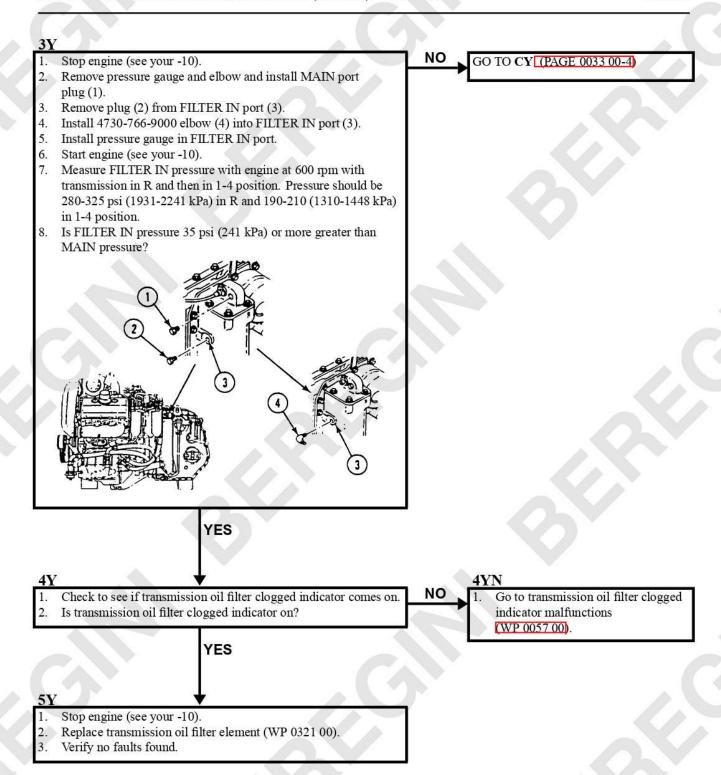
Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in SL (see your -10)
Transmission oil level checked (see your PMCS)
Cab floor plates raised (WP 0395 00)

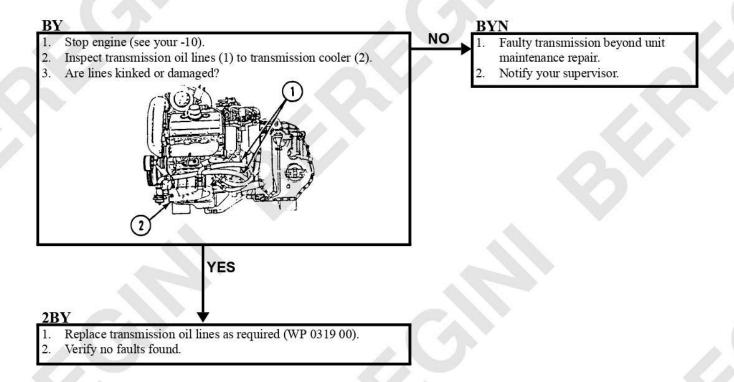


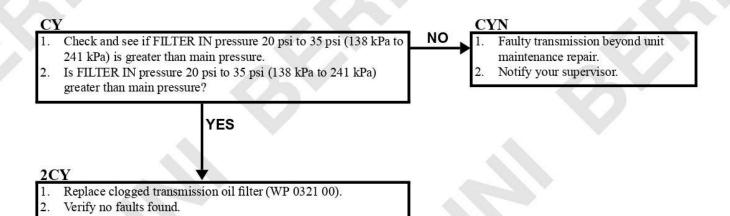
HI TEMP TRANS OIL INDICATOR COMES ON (M548A3)—Continued





HI TEMP TRANS OIL INDICATOR COMES ON (M548A3)—Continued





INITIAL SETUP:

Maintenance Level

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

Equipment Condition

References

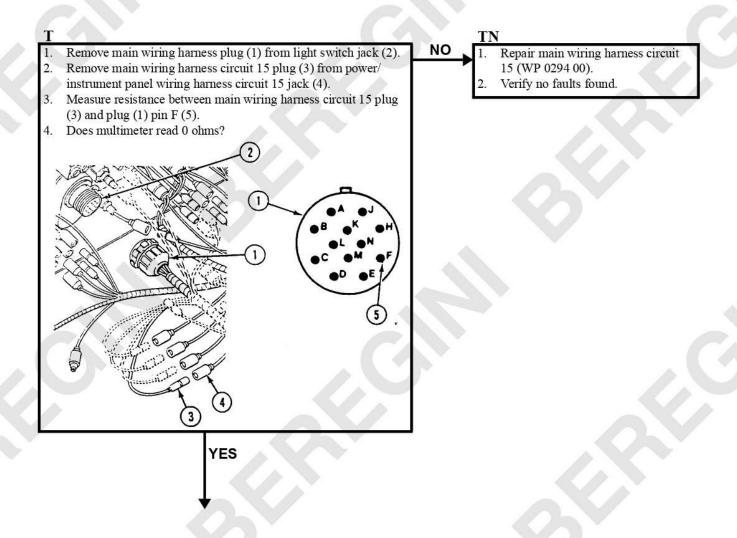
Engine stopped (see your -10)

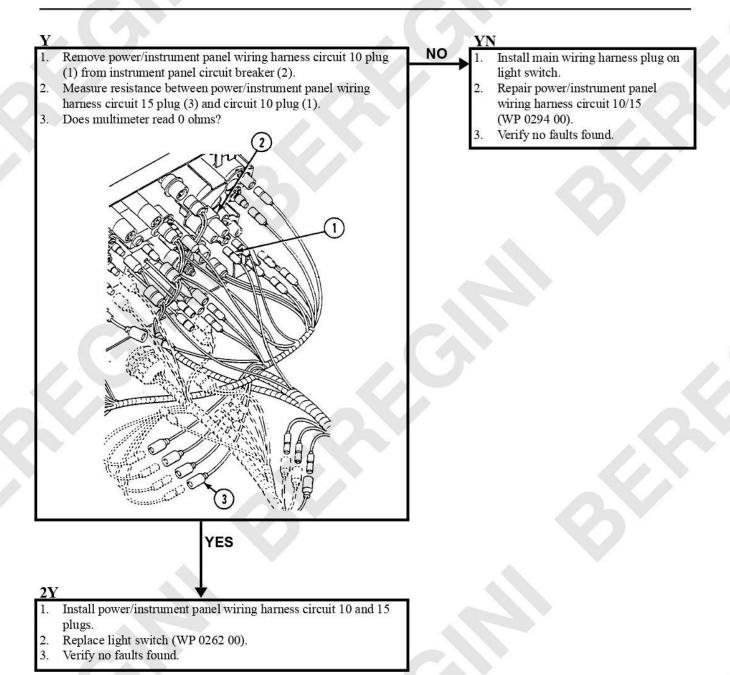
Carrier blocked (see your -10)

Instrument panel partially removed (WP 0256 00)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.





BLACKOUT DRIVE LIGHT DOES NOT WORK

0035 00

INITIAL SETUP:

 Maintenance Level
 References

 Unit
 See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

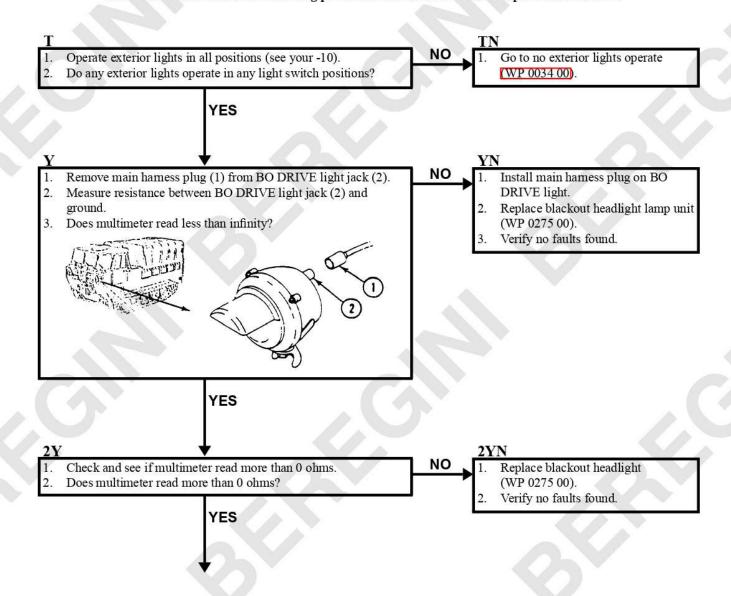
Unit Mechanic

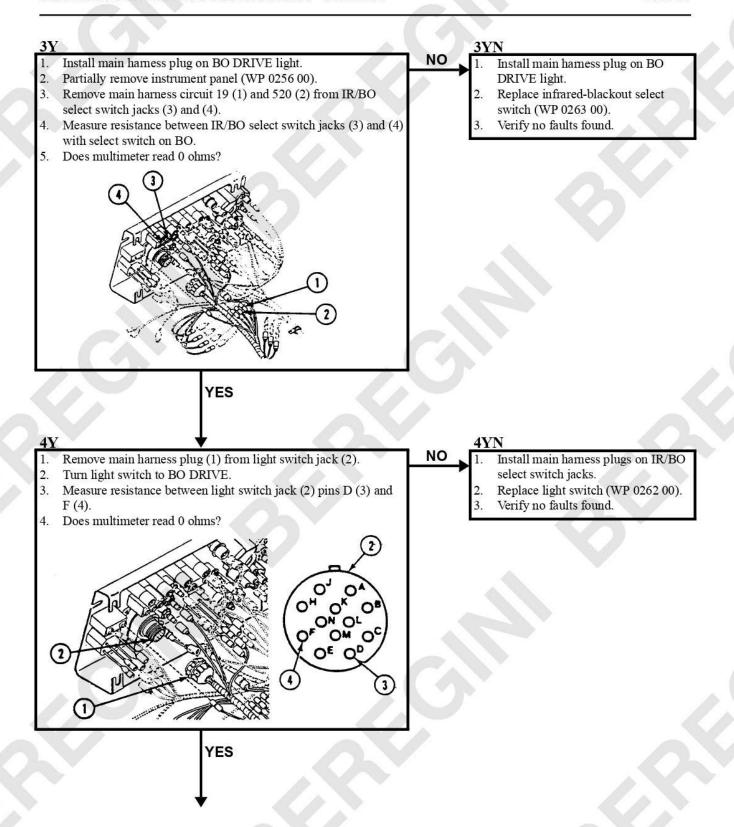
Equipment Condition

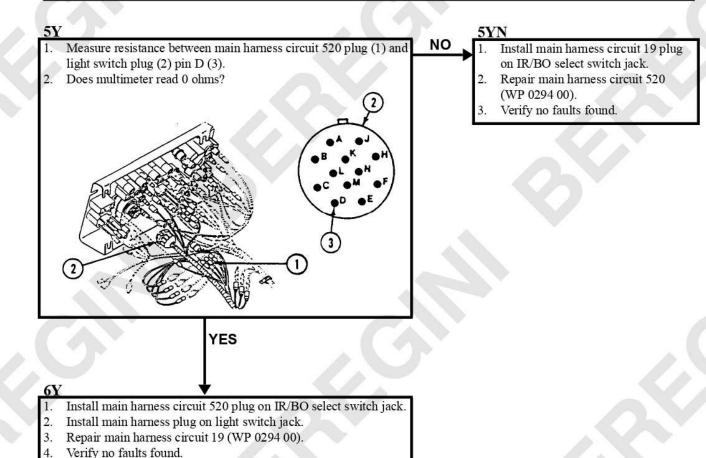
Engine stopped (see your -10)
Carrier blocked (see your -10)
IR/BO select on BO (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.









SERVICE HEADLIGHTS DO NOT OPERATE

0036 00

INITIAL SETUP:

Maintenance Level
Unit
References
See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

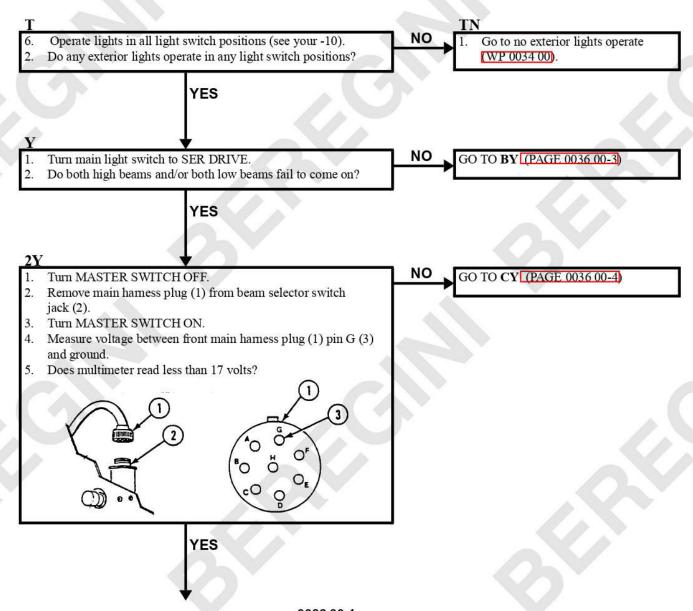
Equipment Condition

Engine stopped (see your -10)

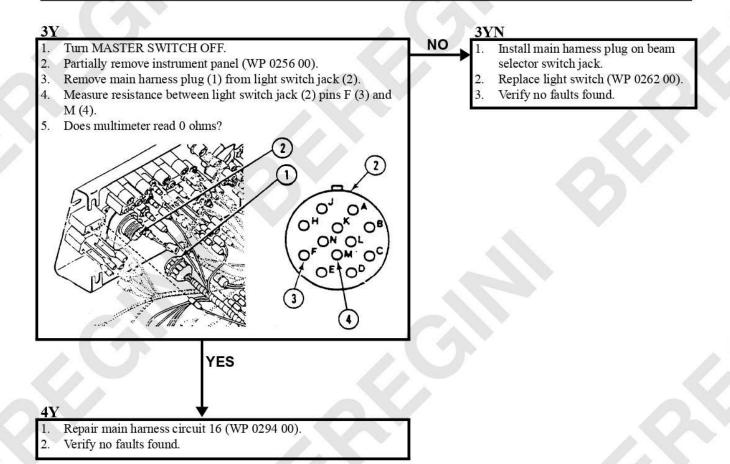
Carrier blocked (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.



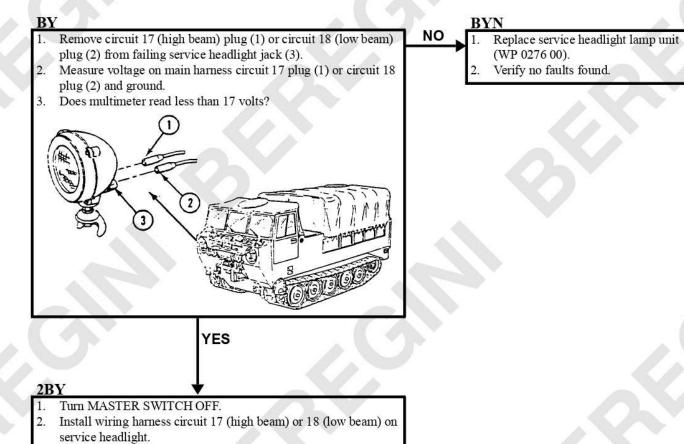
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Repair main wiring harness circuit 17 or 18 between bulkhead

and beam selector switch (WP 0294 00).

Verify no faults found.



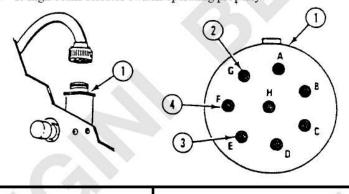
SERVICE HEADLIGHTS DO NOT OPERATE—Continued

003600

CY

- . Measure resistance between beam selector switch jack (1) pins G (2) and E (3) and between pins G (2) and F (4). Multimeter should read 0 ohms once and infinity once.
- Click beam selector switch and measure resistance between beam selector switch jack (1) pins G (2) and E (3) and between pins G (2) and F (4). Multimeter should indicate infinity once and 0 ohms once.

3. Is high beam selector switch operating properly?



YES

- Repair main wiring harness circuit 18 (low beam) or circuit 17 (high beam) (WP 0294 00).
- Verify no faults found.

2CY

NO $\sqrt{1}$

- Install main hamess plug on light switch jack.
- Replace beam selector switch (WP 0273 00).
- Verify no faults found.

INFRARED HEADLIGHT(S) DOES NOT OPERATE

0037 00

INITIAL SETUP:

Maintenance Level References

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

Unit Mechanic

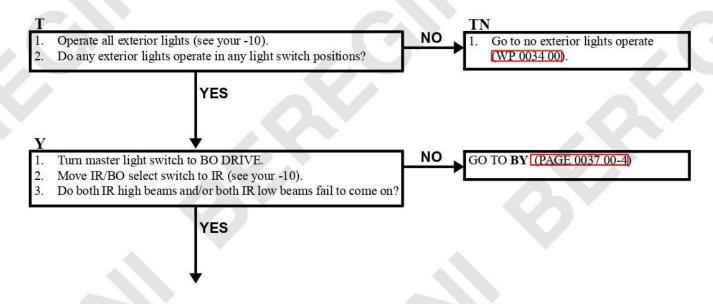
Equipment Condition

Engine stopped (see your -10)

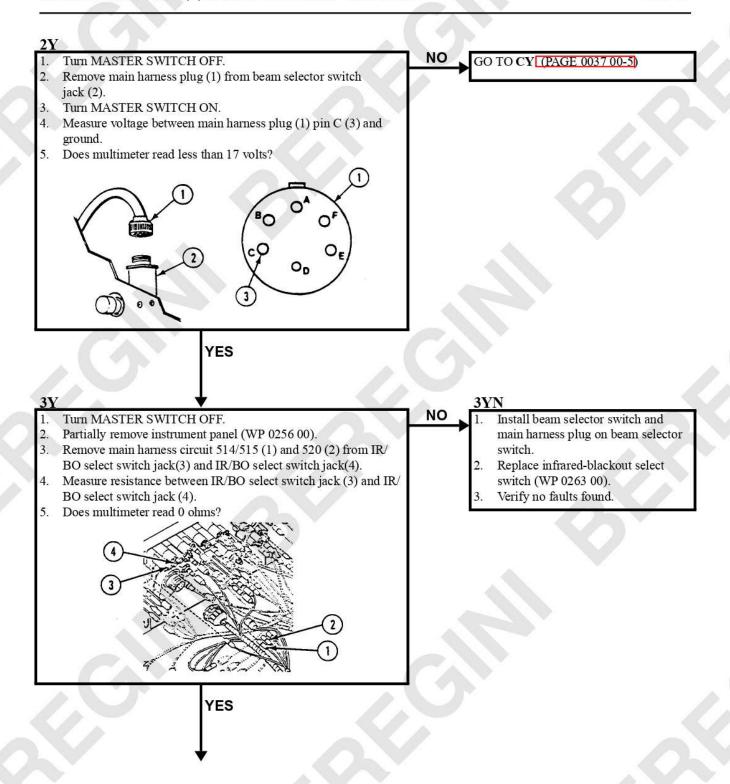
Carrier blocked (see your -10)

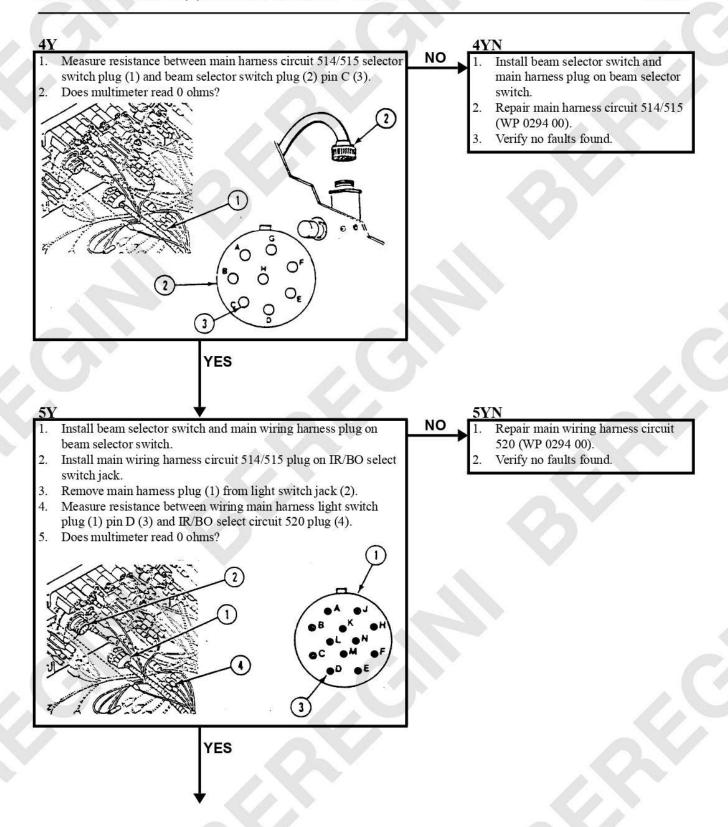
NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.



INFRARED HEADLIGHT(S) DOES NOT OPERATE—Continued



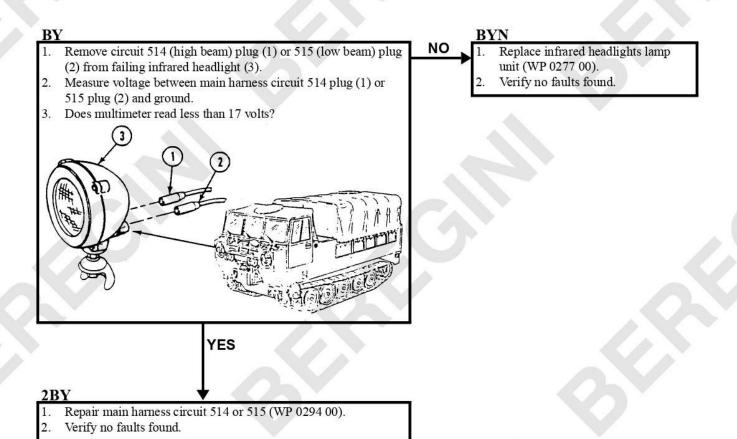


INFRARED HEADLIGHT(S) DOES NOT OPERATE—Continued

0037 00

6Y

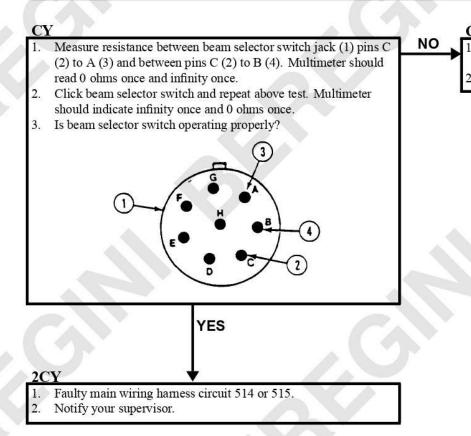
- 1. Install circuit 520 plug on IR/BO select switch.
- 2. Replace light switch (WP 0262 00).
- 3. Verify no faults found.



Replace beam selector switch

Verify no faults found.

(WP 0273 00).





SERVICE AND/OR BLACKOUT STOPLIGHTS MALFUNCTION

0038 00

INITIAL SETUP:

 $\frac{\text{Maintenance Level}}{\text{Unit}} \qquad \qquad \frac{\text{References}}{\text{See your -10}}$

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

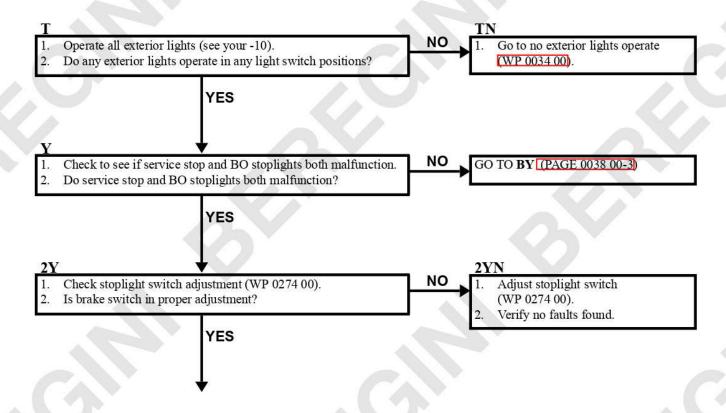
Equipment Condition

Engine stopped (see your -10)

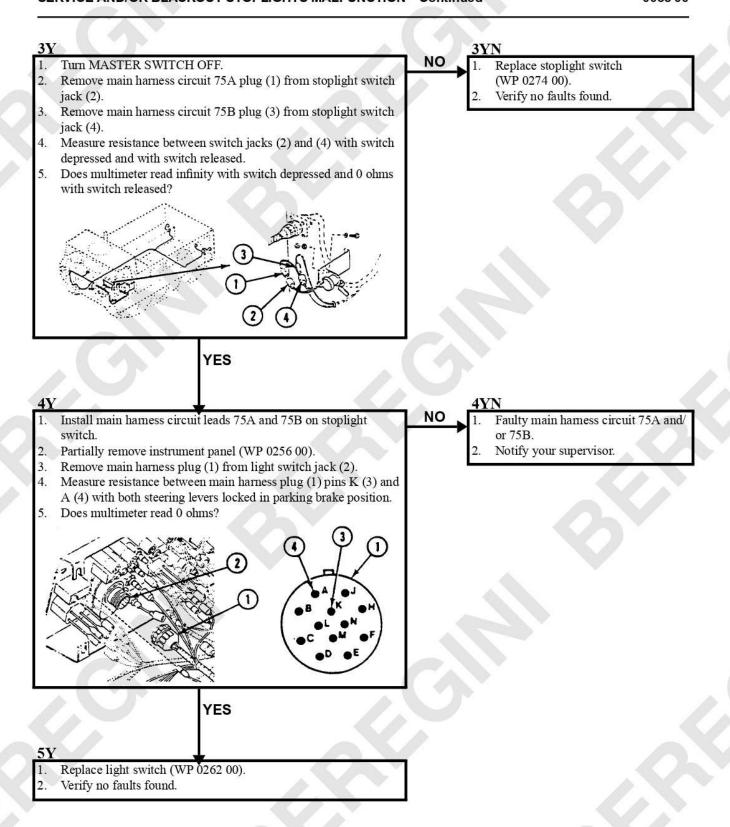
Carrier blocked (see your -10)

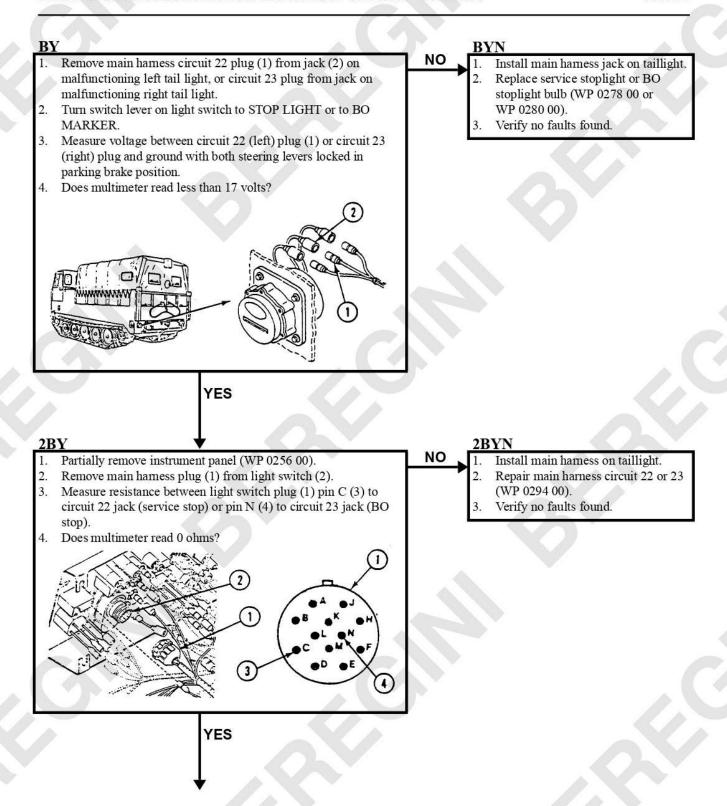
NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1S procedure is shown.



SERVICE AND/OR BLACKOUT STOPLIGHTS MALFUNCTION—Continued





SERVICE AND/OR BLACKOUT STOPLIGHTS MALFUNCTION—Continued

003800

3BY

- Install main harness plugs on jack and taillight. Replace light switch (WP 0262 00). Verify no faults found.

BLACKOUT STOPLIGHT DOES NOT WORK

0039 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

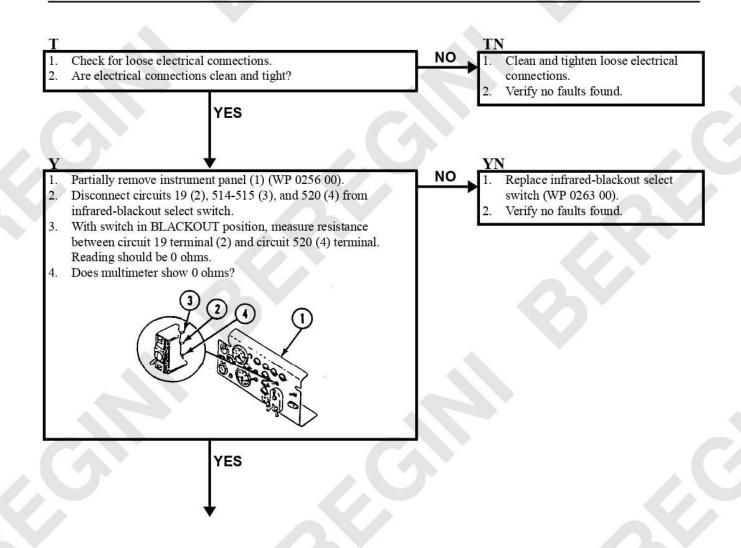
Personnel Required

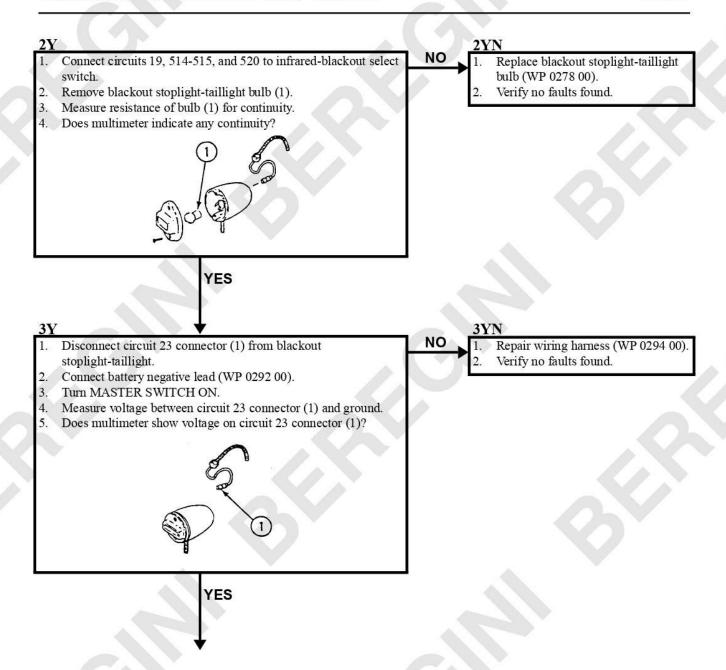
Unit Mechanic

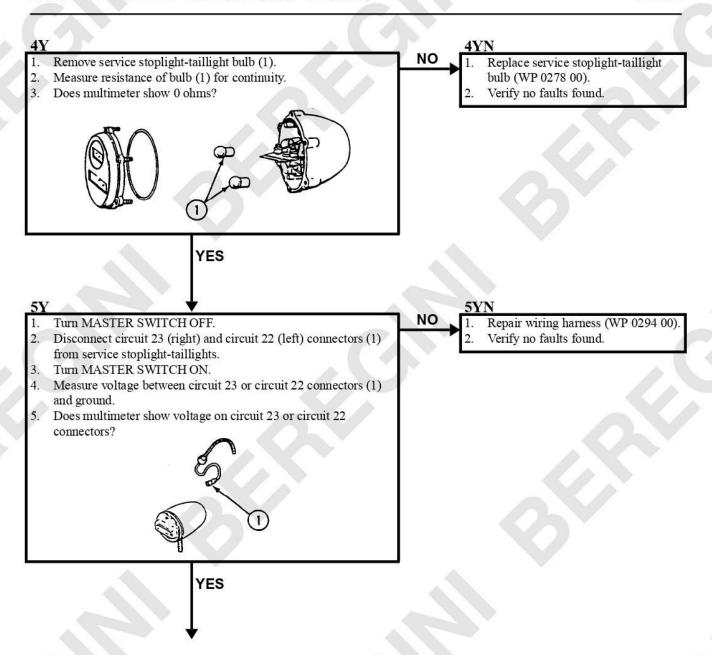
Equipment Condition

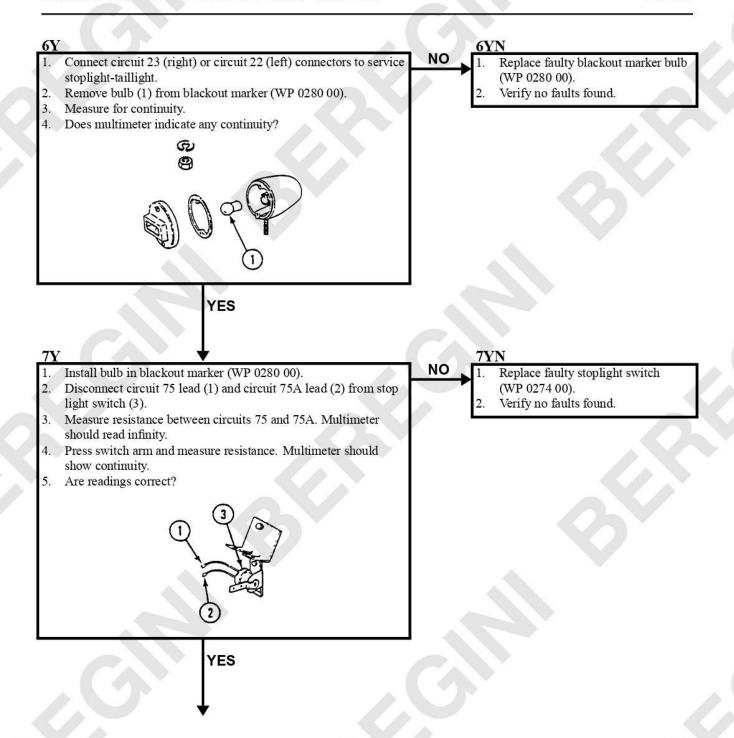
Engine stopped (see your -10) Carrier blocked (see your -10)

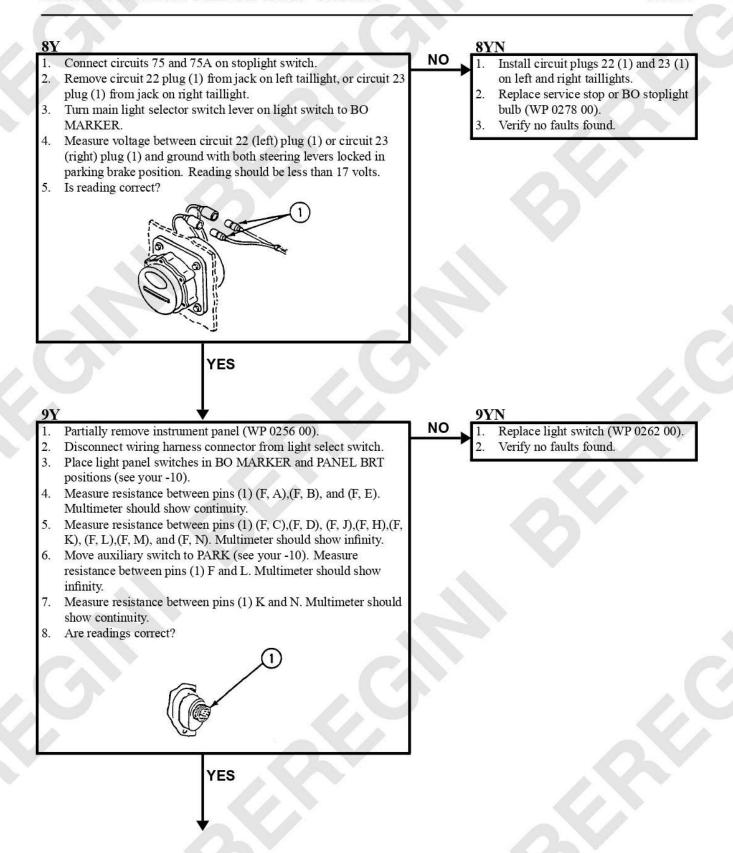
Battery negative lead(s) disconnected (WP 0292 00)











BLACKOUT STOPLIGHT DOES NOT WORK—Continued

003900

10Y

- Adjust stoplight switch (WP 0274 00). Verify no faults found.

BLACKOUT MARKER LIGHT(S) AND/OR TAILLIGHT(S) DO NOT OPERATE

0040 00

INITIAL SETUP:

 Maintenance Level
 References

 Unit
 See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

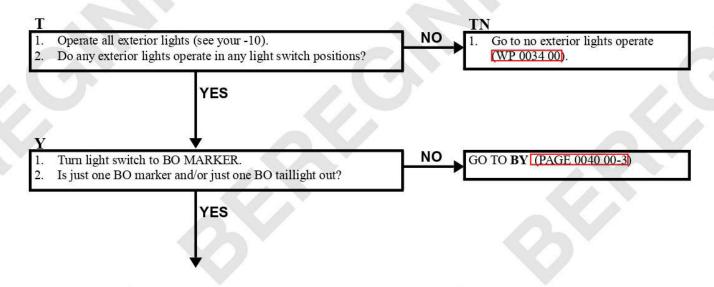
Equipment Condition

Engine stopped (see your -10)

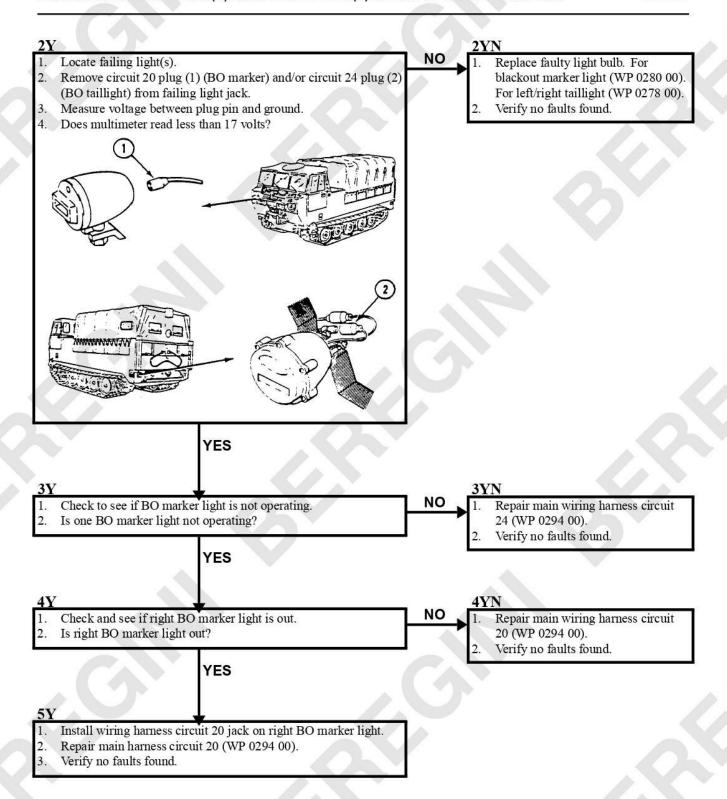
Carrier blocked (see your -10)

NOTE

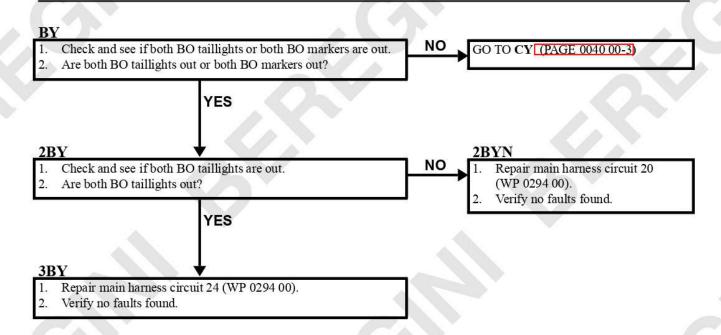
M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

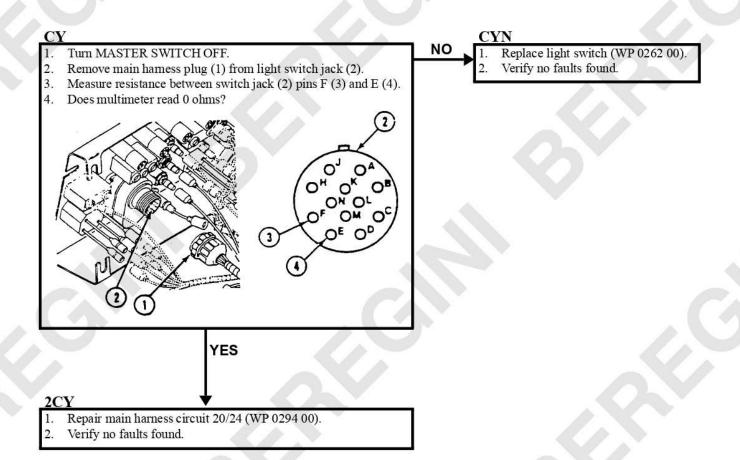


BLACKOUT MARKER LIGHT(S) AND/OR TAILLIGHT(S) DO NOT OPERATE—Continued



BLACKOUT MARKER LIGHT(S) AND/OR TAILLIGHT(S) DO NOT OPERATE—Continued







INITIAL SETUP:

Maintenance Level References

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

Personnel Required

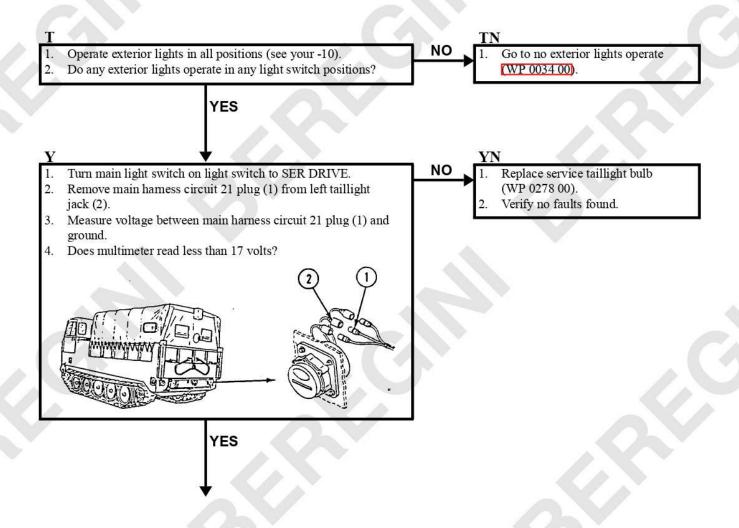
Unit Mechanic

Equipment Condition

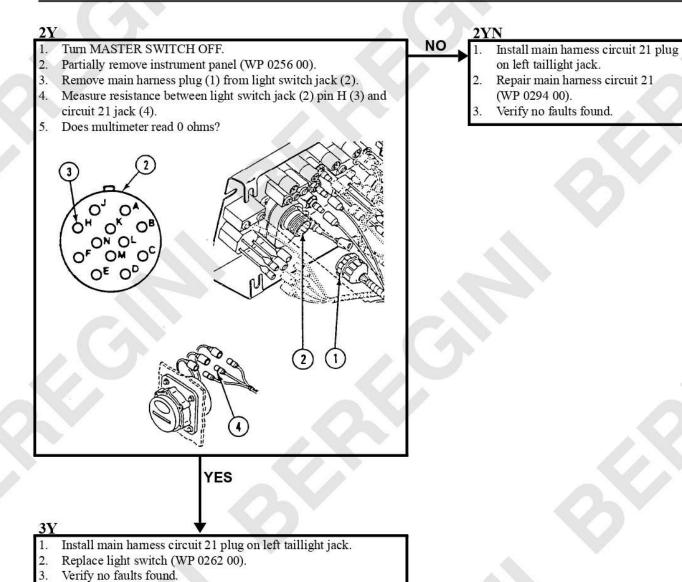
Engine stopped (see your -10)

Carrier blocked (see your -10)

NOTE



Verify no faults found.



SERVICE STOPLIGHT DOES NOT WORK

0042 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

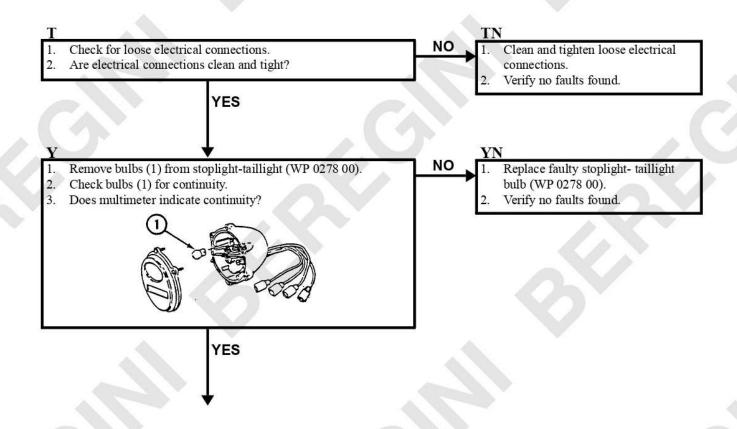
Personnel Required

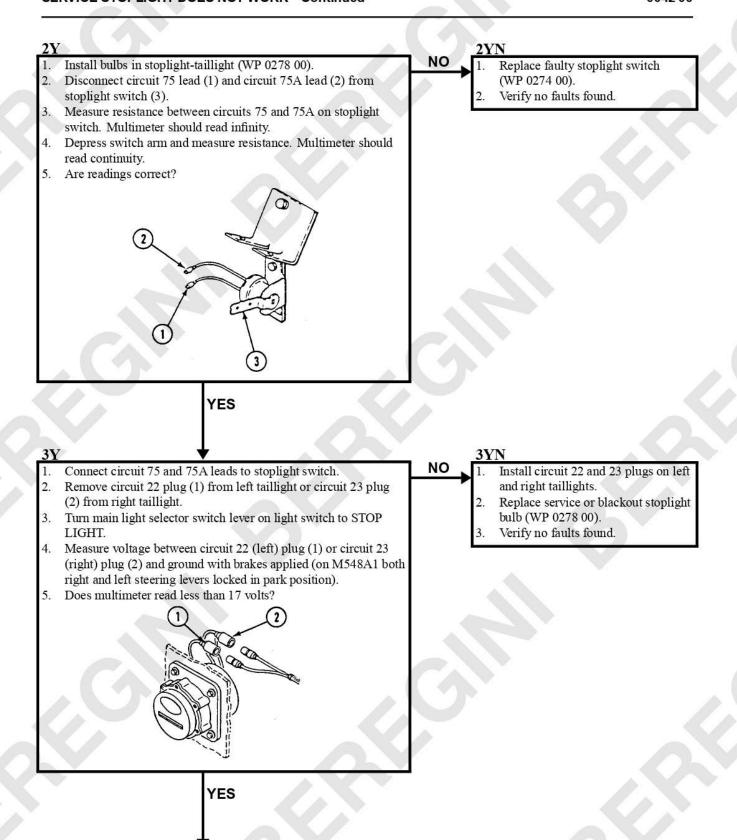
Unit Mechanic

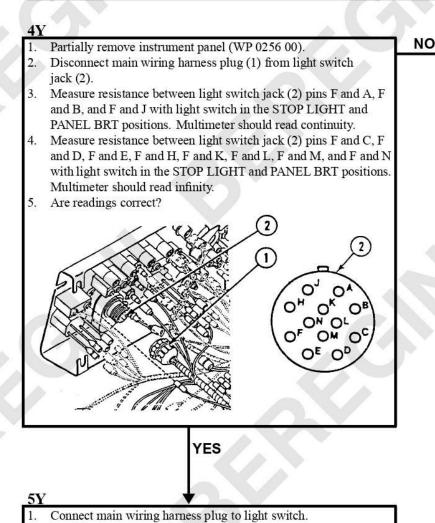
Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

Battery negative lead(s) disconnected (WP 0292 00)







Install instrument panel (WP 0256 00).

Verify no faults found.

Replace light switch (WP 0262 00).
 Verify no faults found.



TRAILER LIGHTS DO NOT OPERATE

0043 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

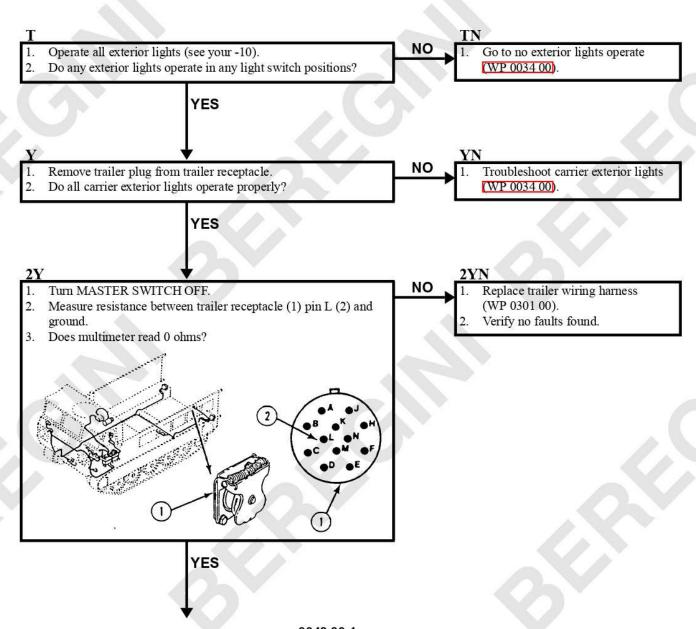
Equipment Condition

Personnel Required
Unit Mechanic

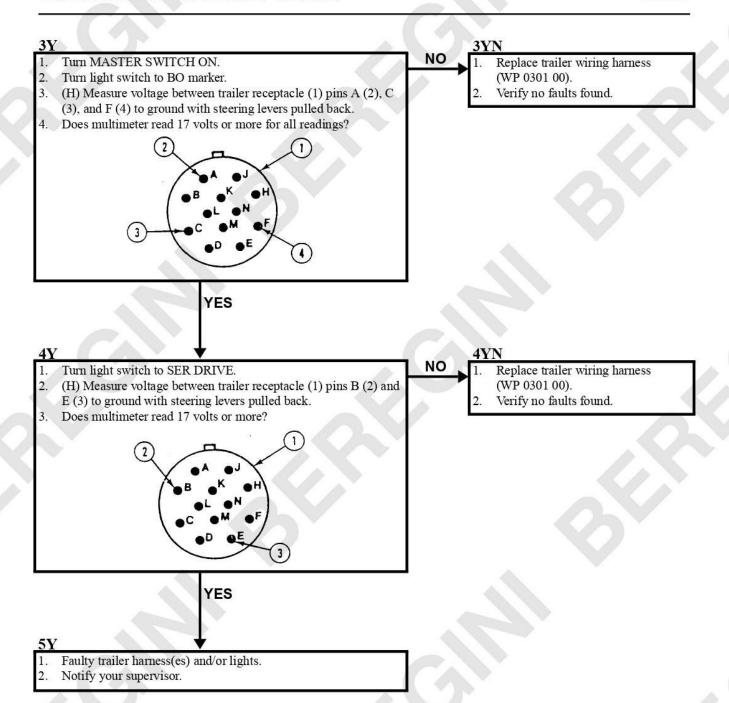
Helper (H)

Engine stopped (see your -10)

Carrier blocked (see your -10)



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INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Equipment Condition

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Jumper Wire

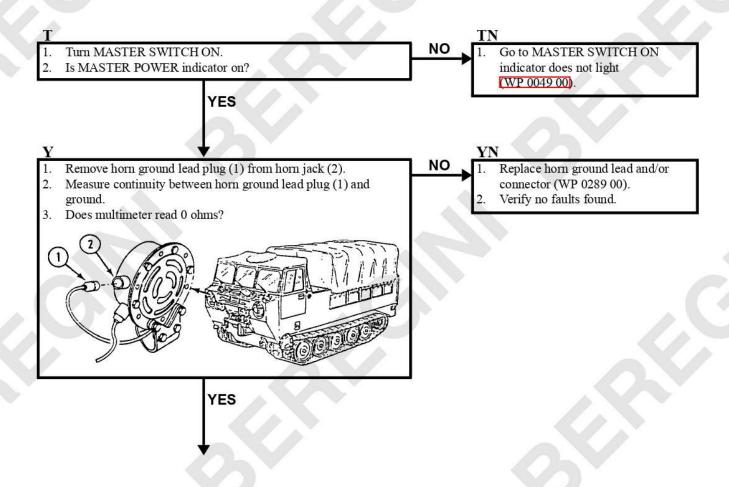
Engine stopped (see your -10) Carrier blocked (see your -10)

Personnel Required

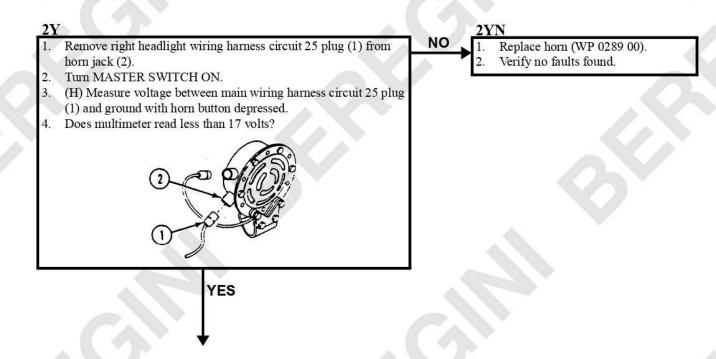
Unit Mechanic

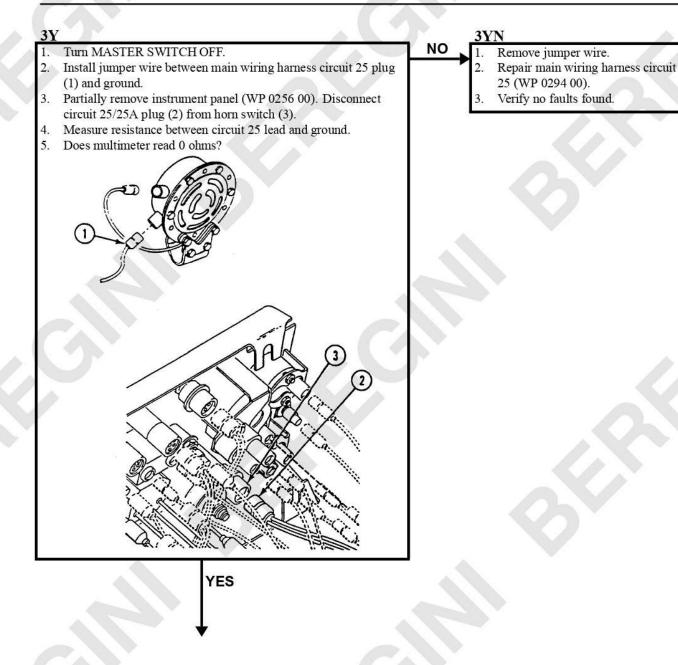
Helper (H)

NOTE

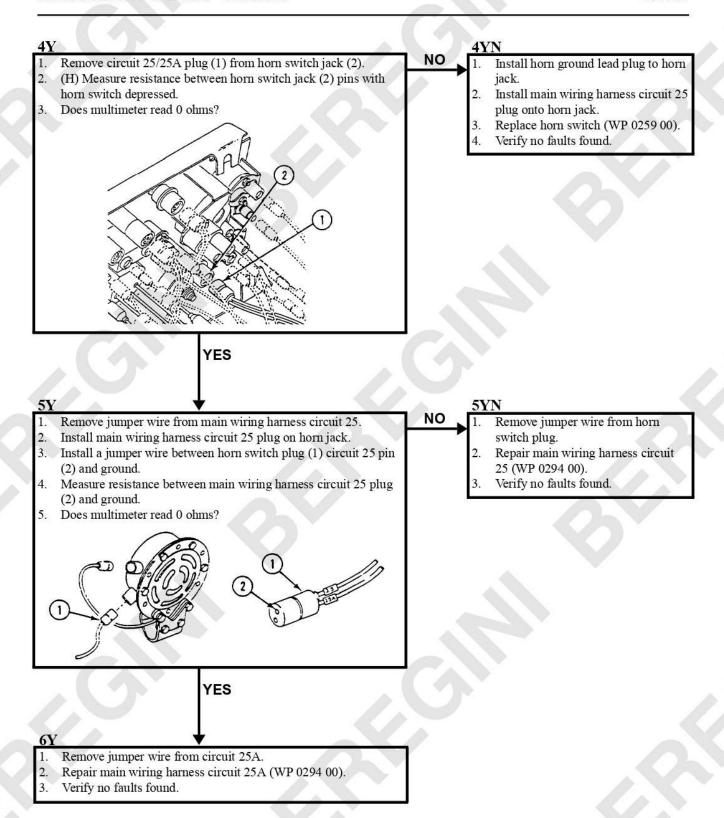


HORN DOES NOT OPERATE—Continued





HORN DOES NOT OPERATE—Continued



INSTRUMENT PANEL ILLUMINATION LIGHTS MALFUNCTION

0045 00

INITIAL SETUP:

 $\frac{\text{Maintenance Level}}{\text{Unit}} \qquad \qquad \frac{\text{References}}{\text{See your -10}}$

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

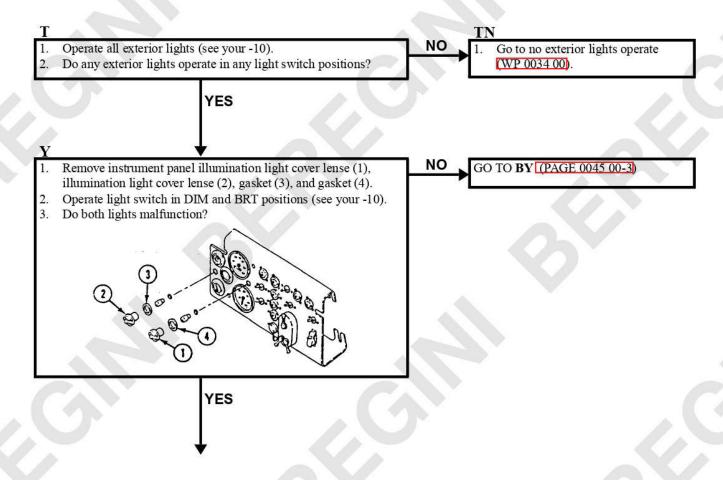
Personnel Required

Unit Mechanic

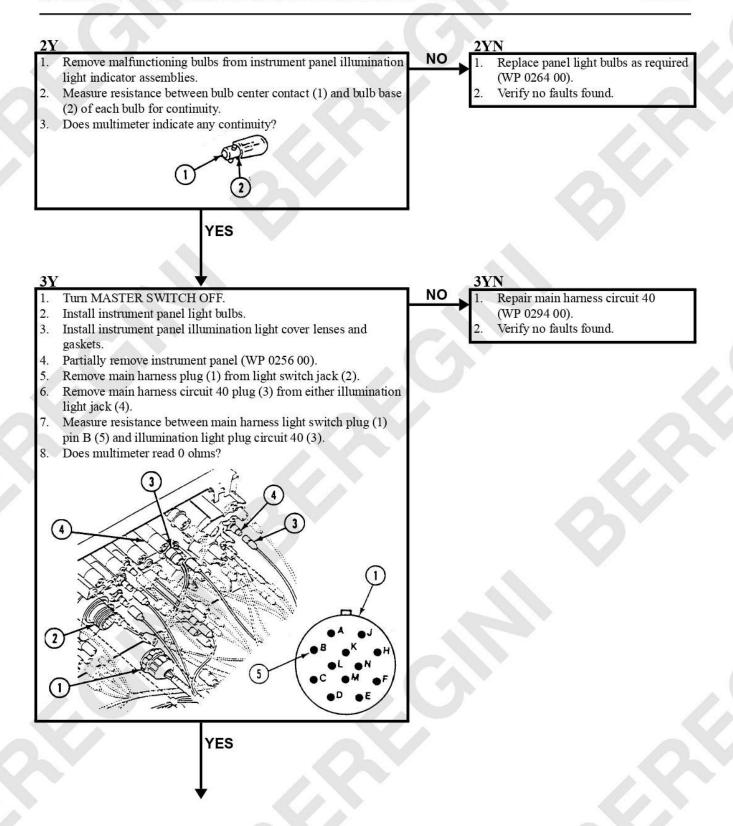
Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

NOTE

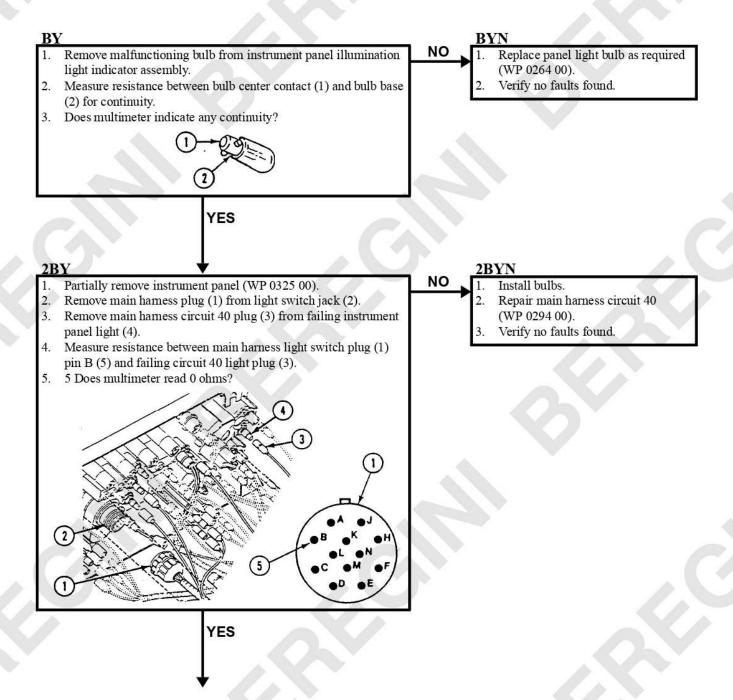


INSTRUMENT PANEL ILLUMINATION LIGHTS MALFUNCTION—Continued



4Y

- 1. Replace light switch (WP 0262 00).
- Verify no faults found.



INSTRUMENT PANEL ILLUMINATION LIGHTS MALFUNCTION—Continued

0045 00

3BY

- Install main hamess plug on light switch jack.
 Replace instrument panel light assembly (WP 0264 00).
 Verify no faults found.

LOW PRESS ENGINE OIL INDICATOR FAILS TO GO OFF AFTER ENGINE STARTS

0046 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Kit (WP 0541 00, Item 6) Oil Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

Unit Mechanic

References

See your -10

See your -PMCS WP 0110 00

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Engine warm

Engine oil level checked (see your PMCS)

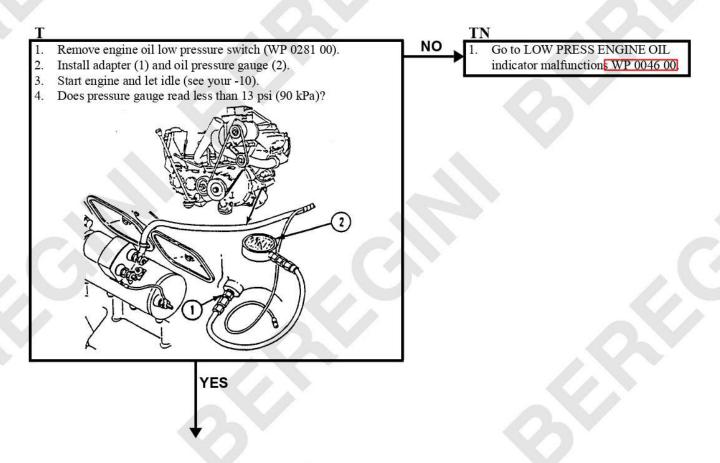
Engine idle speed checked (see your -10)

Cab personnel seats raised (see your -10)

Power plant rear access door/panel removed

(see your -10)

NOTE



LOW PRESS ENGINE OIL INDICATOR FAILS TO GO OFF AFTER ENGINE STARTS—Continued

- Low engine oil pressure. Notify your supervisor.

TRANS LOW OIL PRESS INDICATOR COMES ON (M548A3)

0047 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Tube-pipe Fitting Kit (WP 0541 00, Item 15) Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

Unit Mechanic

References

See your -10 See your PMCS

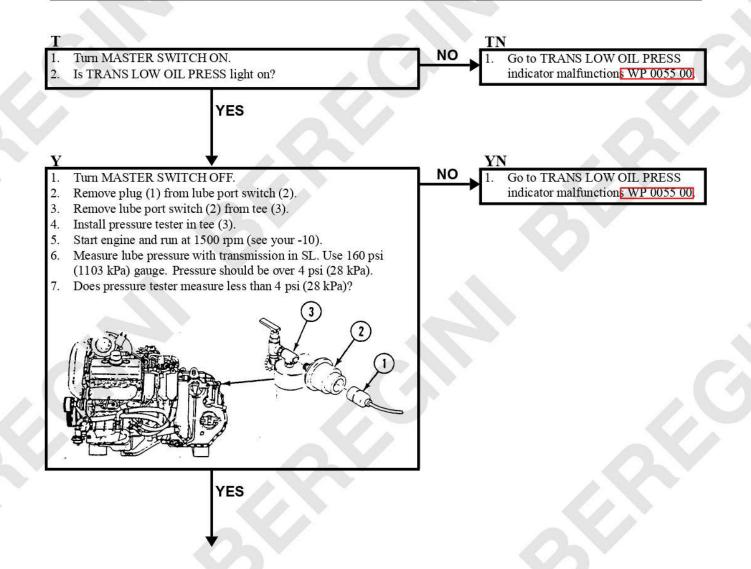
Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Parking brake off (see your -10)
Transmission in SL (see your -10)

Transmission oil level checked (see your PMCS)

Power plant warm

Idle speed set at 600 rpm (see your -10) Center seat raised (see your -10)

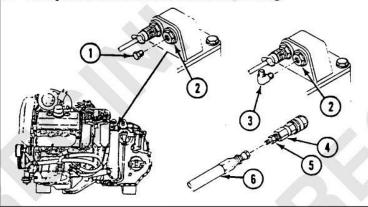


TRANS LOW OIL PRESS INDICATOR COMES ON (M548A3)—Continued

0047 00

2Y

- 1. Stop engine (see your -10).
- 2. Remove pressure tester and install switch.
- 3. Remove plug (1) from MAIN port (2).
- 4. Install 4730-231-5632 elbow (3) into MAIN port (2).
- 5. Remove female quick disconnect (4) and adapter (5) from test hose (6).
- 6. Install test hose (6) on elbow (3).
- 7. Measure MAIN pressure with engine at 600 rpm with transmission in R and then in 1-4 position. Use 400 psi (2758 kPa) gauge. Pressure should be 280-325 psi (1930-2241 kPa) in R and 190-210 psi (1310-1448 kPa) in 1-4 position.
- B. Does pressure tester indicate an incorrect reading?



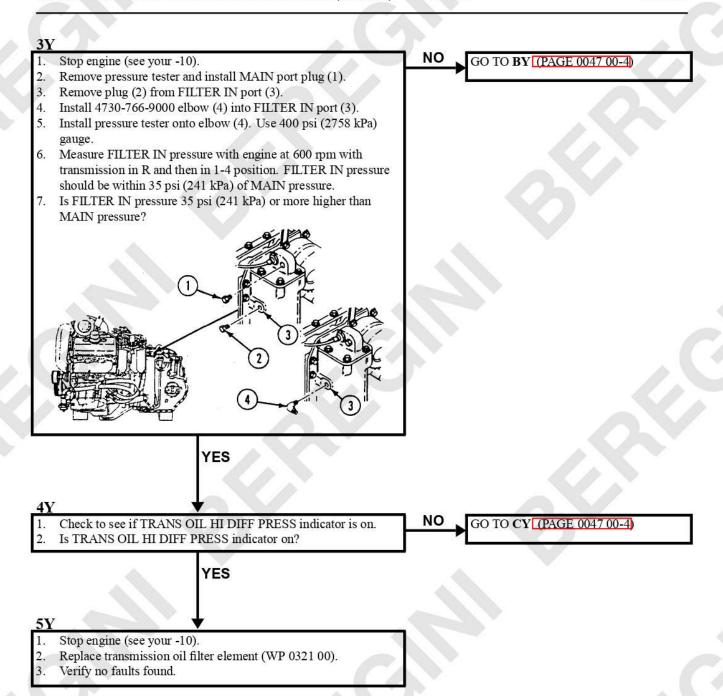
2YN

NO

- Transmission low lube pressure.
 Beyond unit maintenance repair.
- Notify your supervisor.

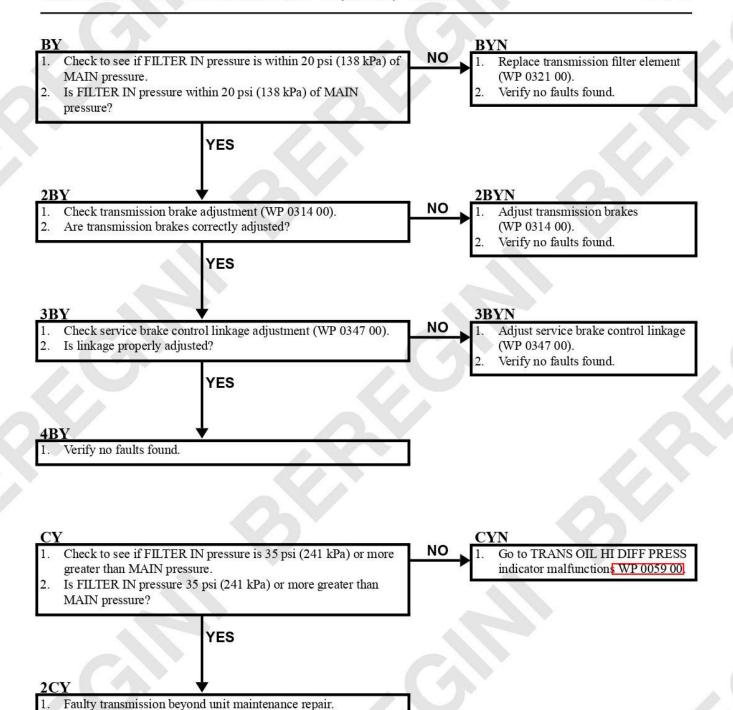
YES

TRANS LOW OIL PRESS INDICATOR COMES ON (M548A3)—Continued



TRANS LOW OIL PRESS INDICATOR COMES ON (M548A3)—Continued

Notify your supervisor.



DOME LIGHT WORKS IMPROPERLY

0048 00

INITIAL SETUP:

Maintenance Level Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

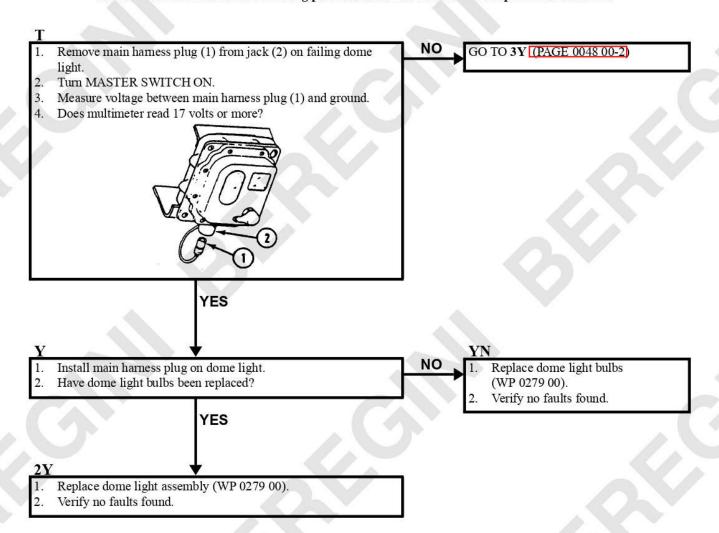
References

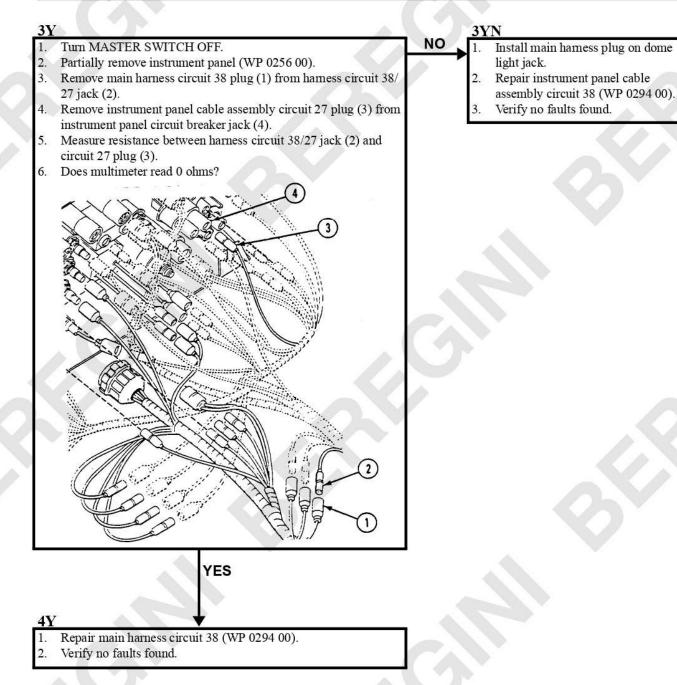
See your -10

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

NOTE





INITIAL SETUP:

Maintenance Level

Unit

See your -10

References

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

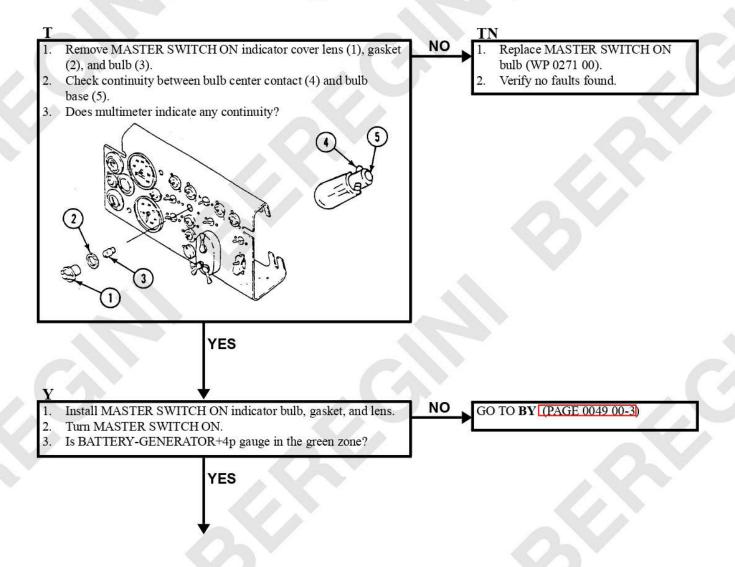
Unit Mechanic

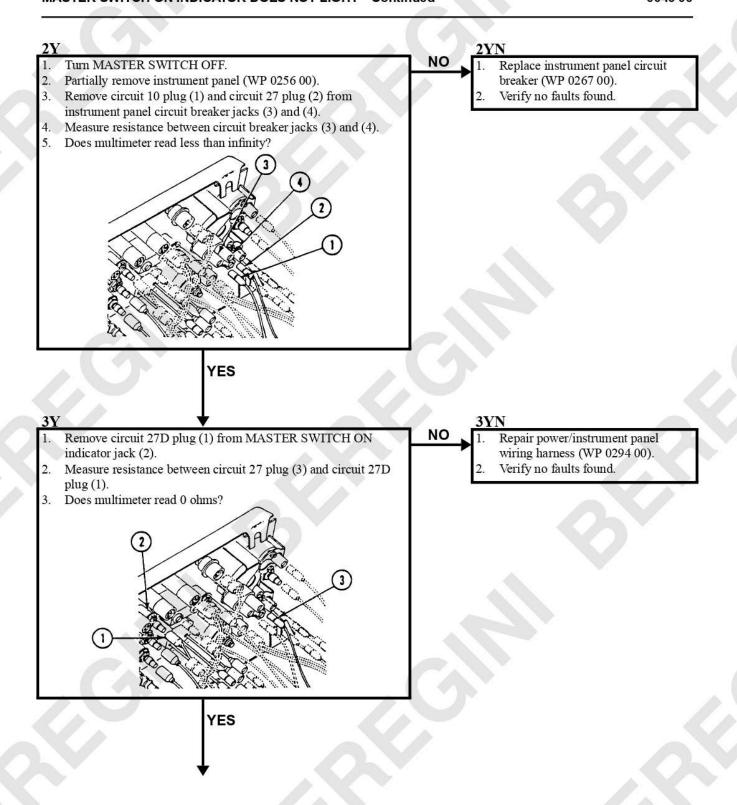
Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

NOTE



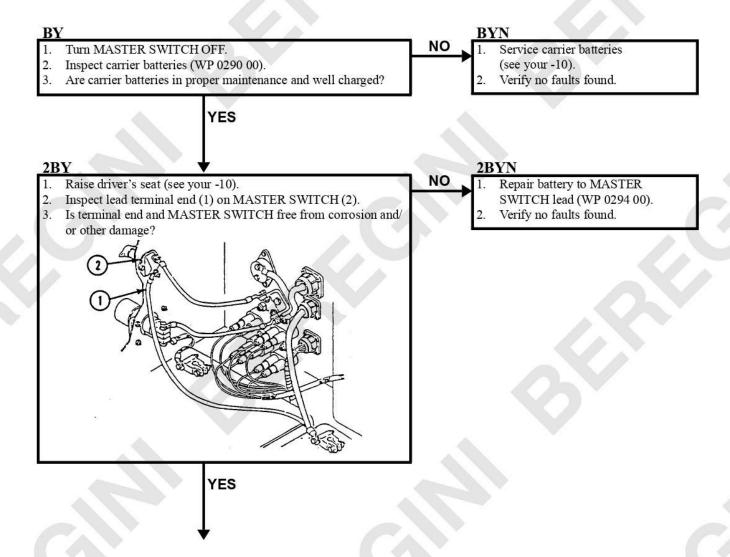


MASTER SWITCH ON INDICATOR DOES NOT LIGHT—Continued

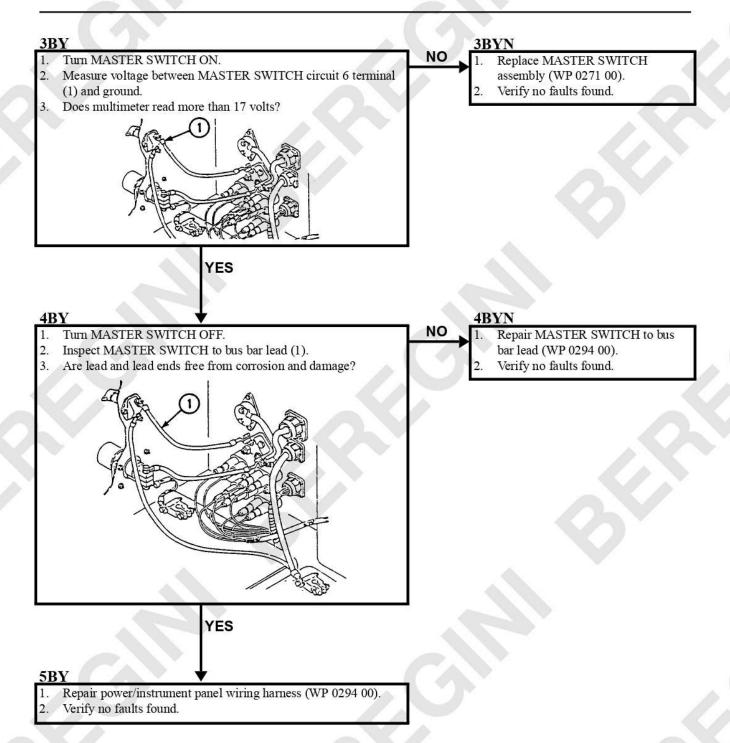
0049 00

4Y

- Replace MASTER SWITCH ON indicator assembly (WP 0271 00).
- 2. Verify no faults found.



MASTER SWITCH ON INDICATOR DOES NOT LIGHT—Continued



FUEL LEVEL INDICATOR MALFUNCTIONS

0050 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Jumper Wire

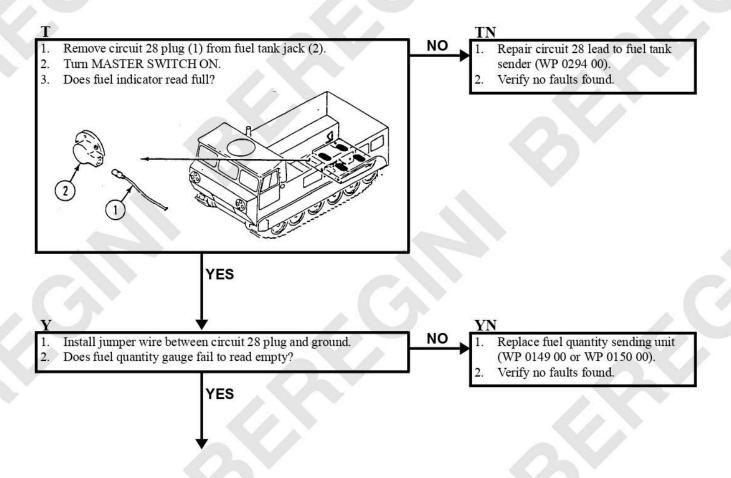
Equipment Condition

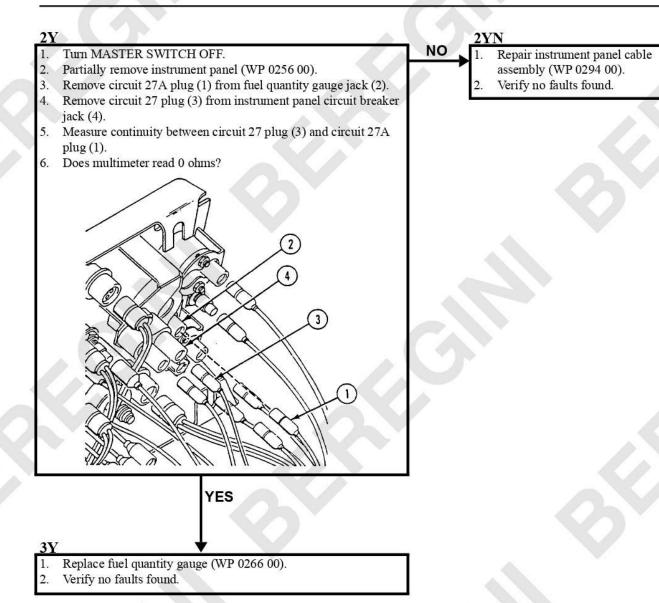
Engine stopped (see your -10) Carrier blocked (see your -10)

Personnel Required

Unit Mechanic

NOTE





INITIAL SETUP:

Maintenance Level References Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Jumper Wire

Personnel Required

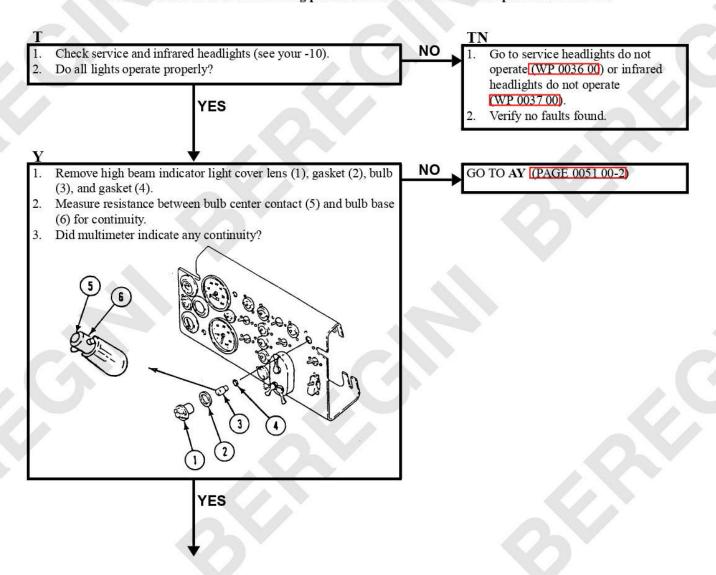
Unit Mechanic

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

MASTER SWITCH OFF (see your -10)

NOTE

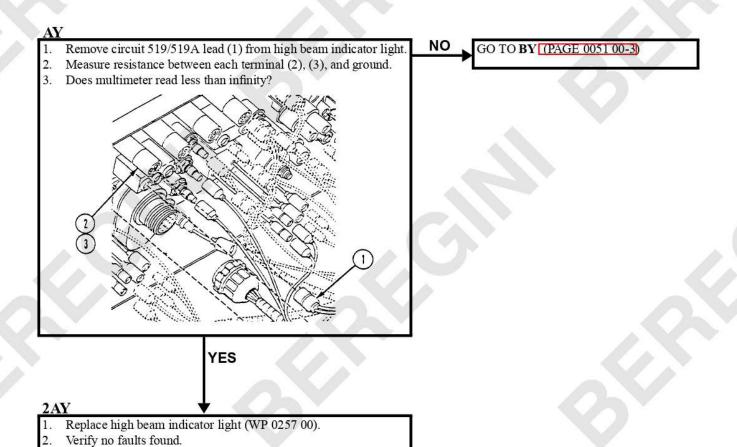


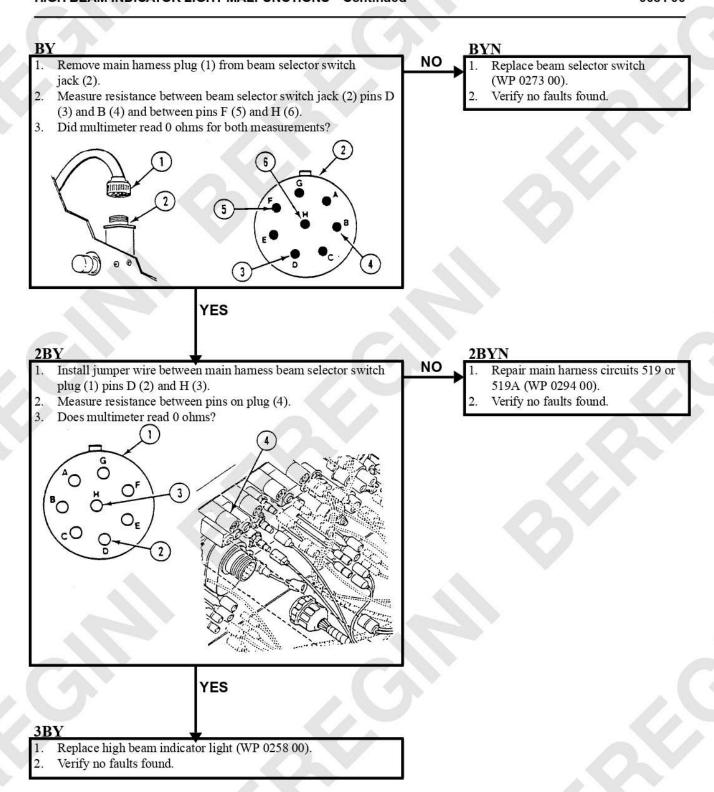
HIGH BEAM INDICATOR LIGHT MALFUNCTIONS—Continued

0051 00

2Y

- 1. Replace high beam indicator light bulb (WP 0257 00).
- 2. Verify no faults found.







BATTERY/GENERATOR INDICATOR MALFUNCTIONS

0052 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Kit (WP 0541 00, Item 6) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

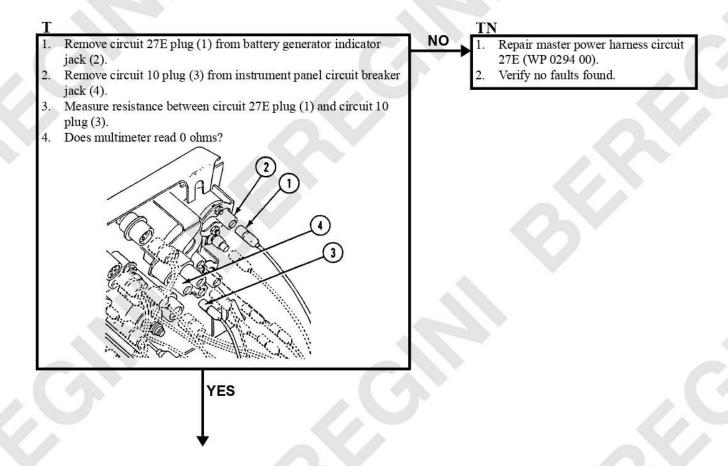
See your -10 (WP 0052 00)

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.



BATTERY/GENERATOR INDICATOR MALFUNCTIONS—Continued

- Replace BATTERY/GENERATOR indicator panel light (WP 0264 00). Verify no faults found.

COOLANT TEMPERATURE GAUGE MALFUNCTIONS

0053 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Jumper wire

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

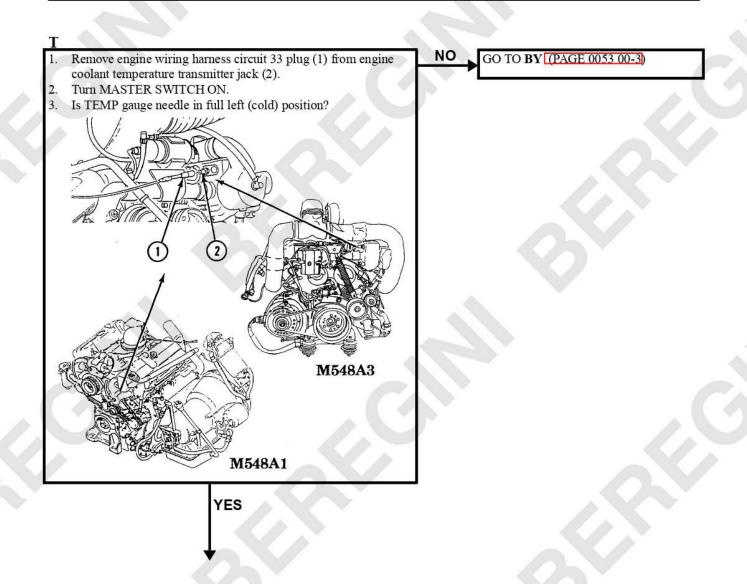
Engine stopped (see your -10)

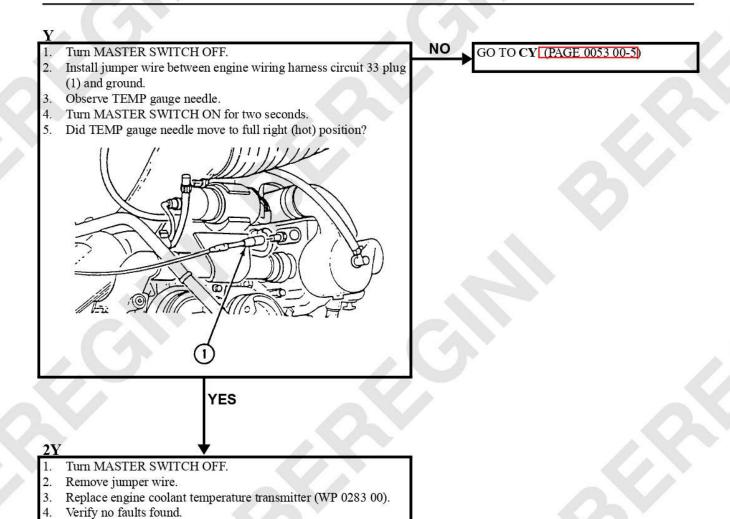
Carrier blocked (see your -10)

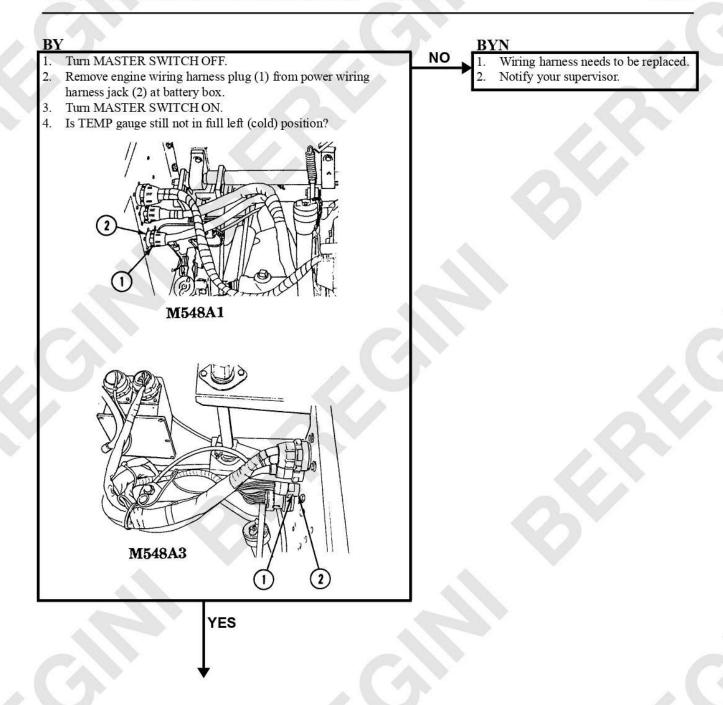
Cab personnel seats raised (see your -10)

Power plant rear access door/panel removed

(see your -10)







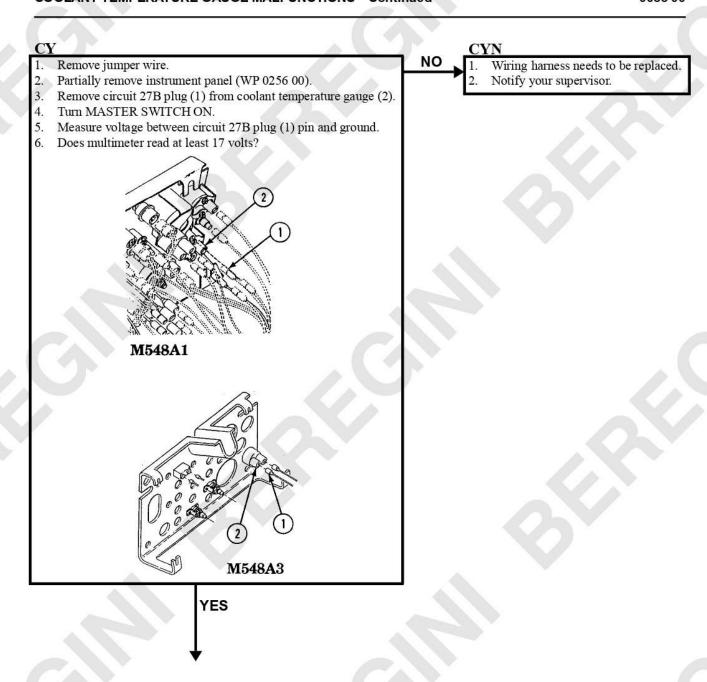
NO Turn MASTER SWITCH OFF. Partially remove instrument panel (WP 0256 00). 3. Remove power wiring harness circuit 33 plug (1) from TEMP gauge jack (2). 4. Measure resistance between power wiring harness circuit 33 plug (1) and ground. Does multimeter read infinity? M548A1 M548A3 YES

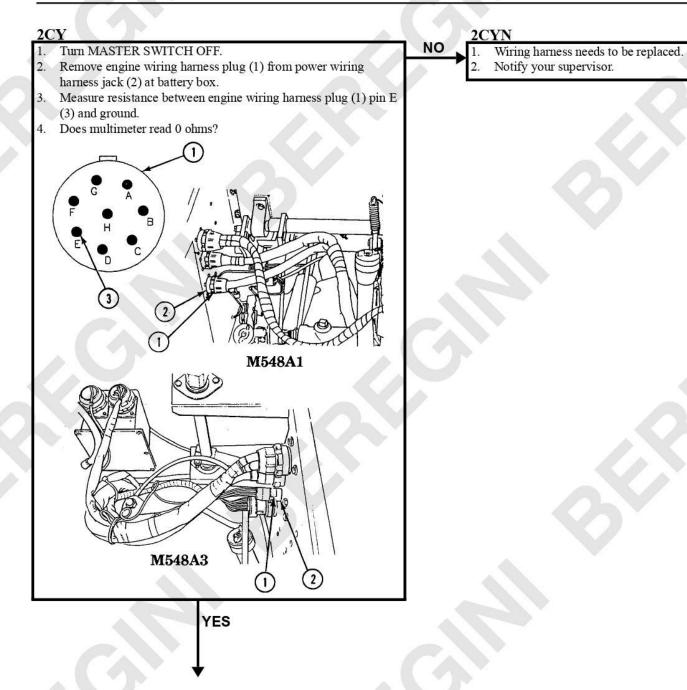
2RVN

- 1. Wiring harness needs to be replaced.
 - Notify your supervisor.

3BY

- Install engine wiring harness plug on power wiring harness jack at battery box.
- Install engine wiring harness circuit 33 plug on engine temperature transmitter jack.
- 3. Replace TEMP gauge (WP 0266 00).
- Verify no faults found.





3CY Install engine wiring harness circuit 33 plug on engine coolant temperature transmitter. Install jumper wire between power wiring hamess jack (1) pin E (2) and ground (at battery box). Remove power wiring harness circuit 33 plug (3) from TEMP gauge jack (4). Measure resistance between power wiring harness circuit 33 (3) and ground. 5. Does multimeter read 0 ohms? M548A1 M548A3 YES Remove jumper wire. Install engine wiring harness plug onto power wiring harness jack

NO

- Remove jumper wire.
- Wiring harness needs to be replaced.
- Notify your supervisor.

- at battery box.
- Replace TEMP gauge (WP 0266 00).
- Verify no faults found.



LO PRESS ENGINE OIL INDICATOR MALFUNCTIONS

0054 00

INITIAL SETUP:

Maintenance Level

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

Jumper Wire

Personnel Required

Unit Mechanic

Equipment Condition

References

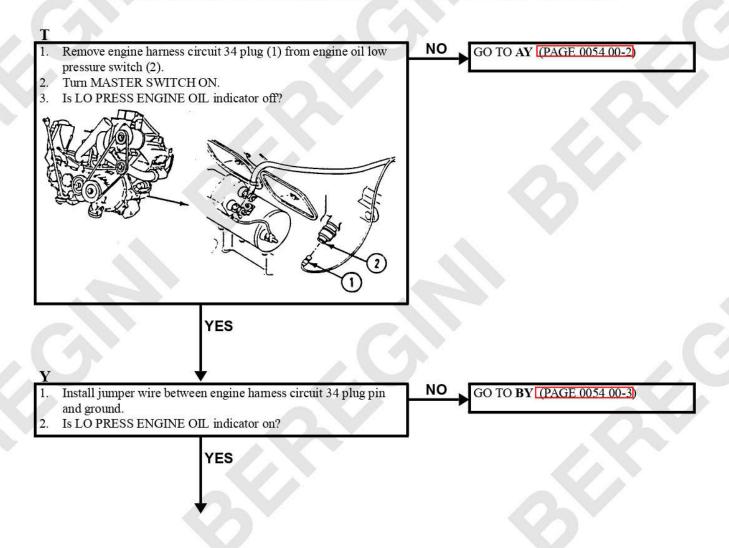
Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat raised (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

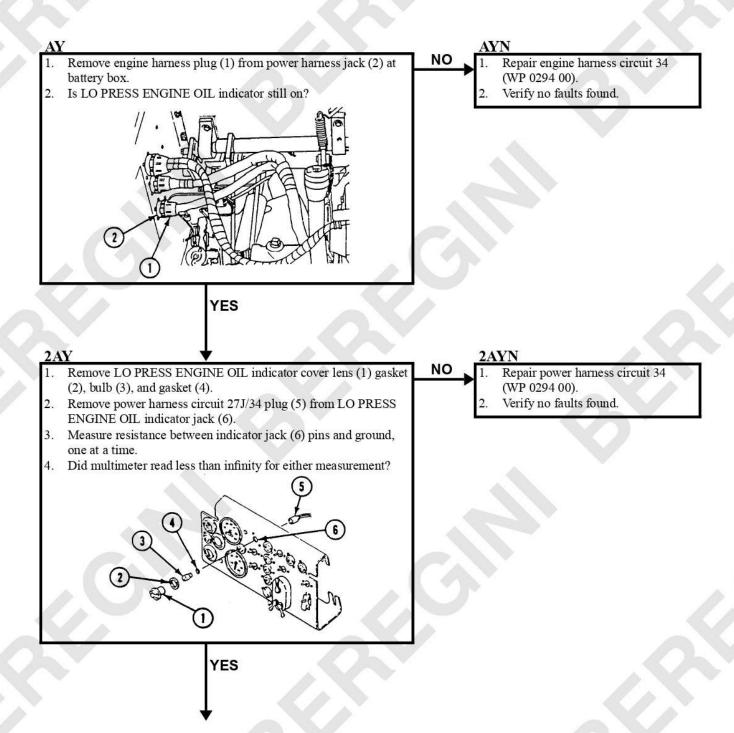


LO PRESS ENGINE OIL INDICATOR MALFUNCTIONS—Continued

005400

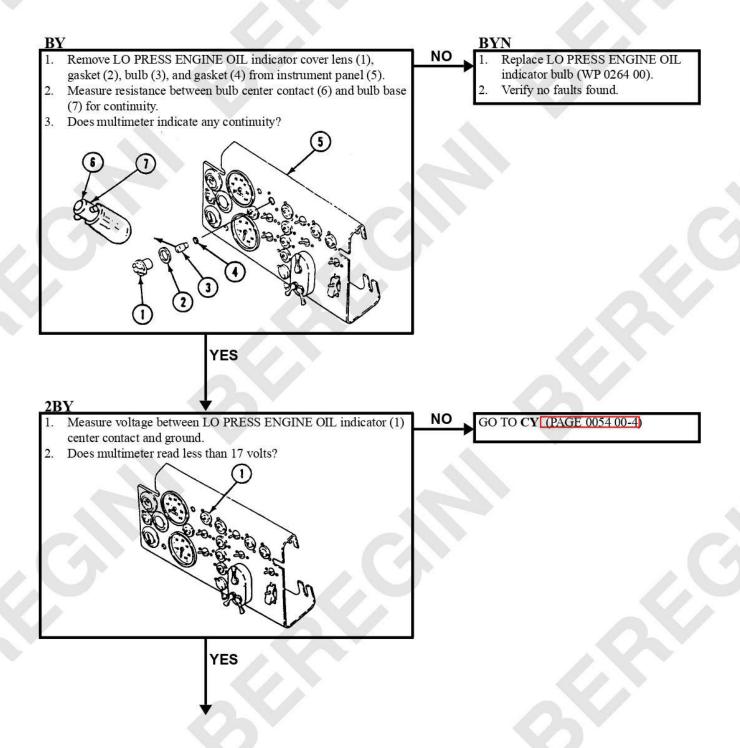
2Y

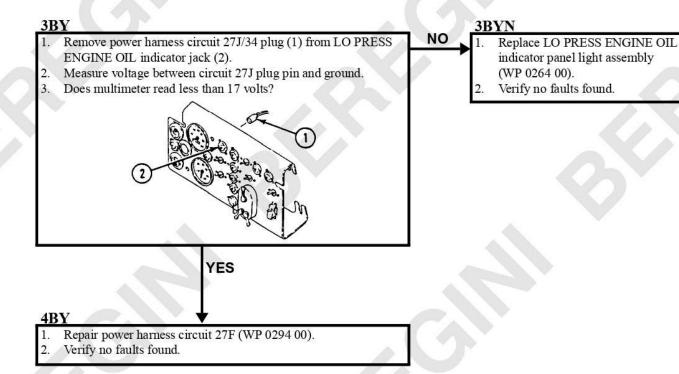
- 1. Replace engine oil low pressure switch (WP 0281 00).
- Verify no faults found.

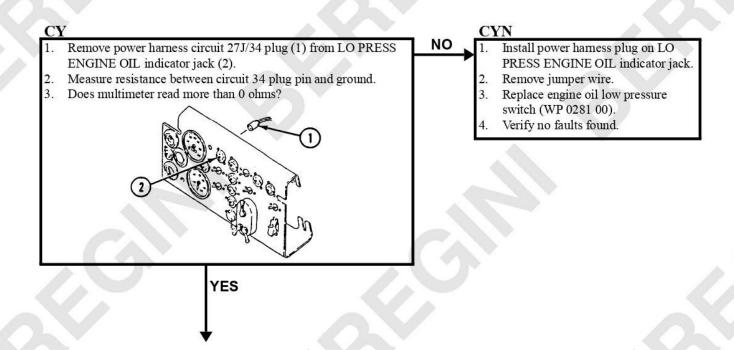


3AY

- Replace LO PRESS ENGINE OIL indicator panel light assembly (WP 0264 00).
- 2. Verify no faults found.

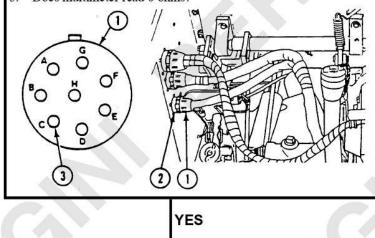






2CY

- 1. Remove engine harness plug (1) from power harness jack (2) at battery box.
- Measure resistance between engine harness plug (1) pin D (3) and ground.
- 3. Does multimeter read 0 ohms?



NO $\frac{2CY}{1-R}$

- . Remove jumper wire.
- Install power hamess plug on LO PRESS ENGINE OIL indicator jack.
- 3. Install indicator cover lens and bulb.
- 4. Repair engine harness circuit 34 (WP 0294 00).
- Verify no faults found.

3CY

- Remove jumper wire.
- 2. Install engine harness onto LO PRESS ENGINE OIL switch.
- 3. Repair power harness circuit 34 (WP 0294 00).
- 4. Verify no faults found.



TRANS LOW OIL PRESS INDICATOR MALFUNCTIONS (M548A3)

0055 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanics Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Jumper Wire

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

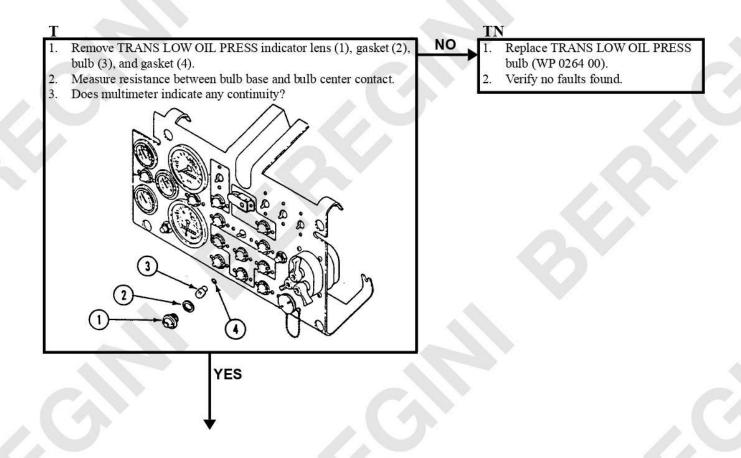
Parking brake off (see your -10)

Service brake off (see your -10)

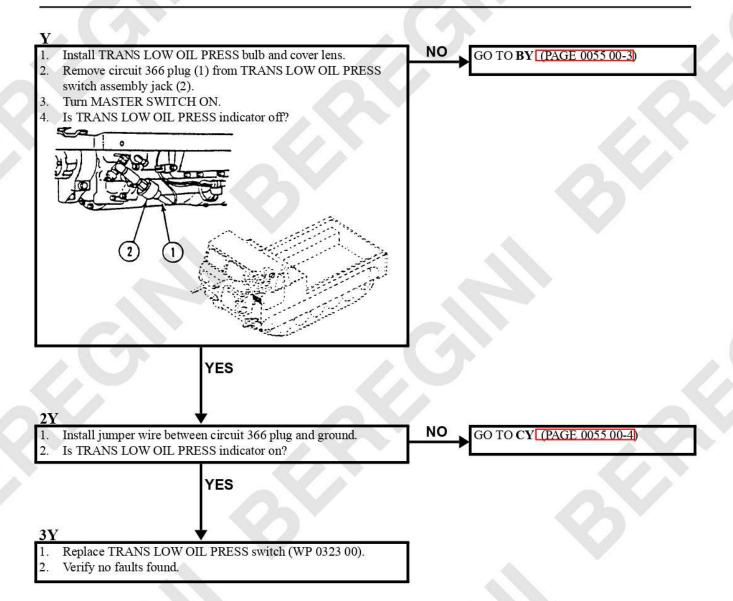
Carrier blocked (see your -10)

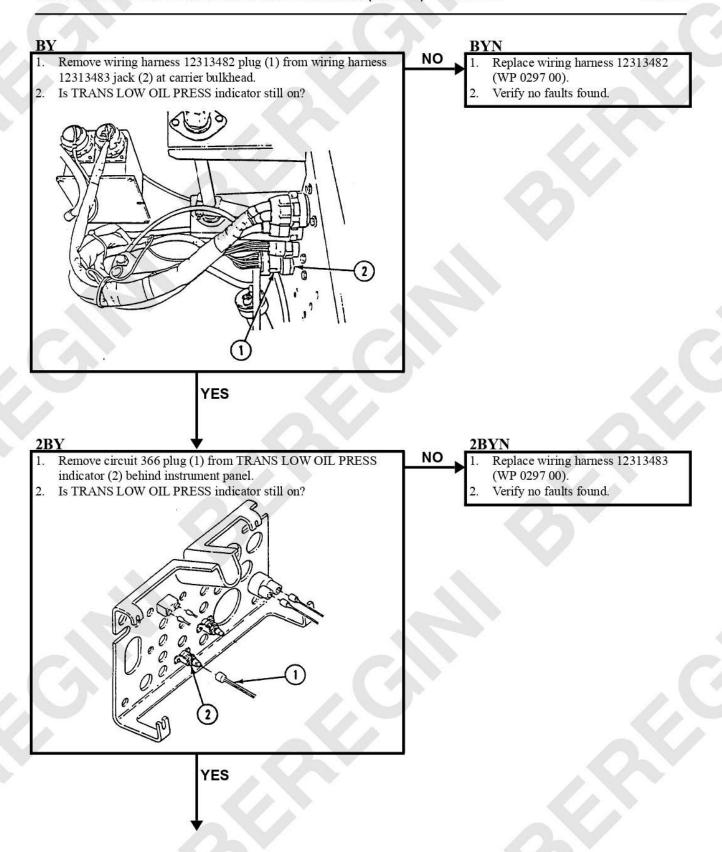
Center seat raised (see your -10)

Floor plates removed (WP 0395 00)



TRANS LOW OIL PRESS INDICATOR MALFUNCTIONS (M548A3)—Continued





TRANS LOW OIL PRESS INDICATOR MALFUNCTIONS (M548A3)—Continued

0055 00

3BY

- Replace TRANS LOW OIL PRESS indicator assembly (WP 0264 00).
- 2. Verify no faults found.

CY

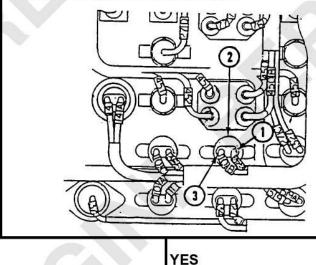
- Remove TRANS LOW OIL PRESS lens, gasket, bulb, and gasket from indicator assembly.
- Measure voltage between center contact on indicator assembly and ground.
- 3. Does multimeter read 17 volts or more?

GO TO DY (PAGE 0055 00-5)



2CY

- 1. Remove wiring harness 12313483 circuit plug (1) from TRANS LOW OIL PRESS indicator assembly (2).
- 2. Measure resistance between circuit 366/10B plug (3), circuit 366 pin, and ground.
- 3. Does multimeter read more than 0 ohms?



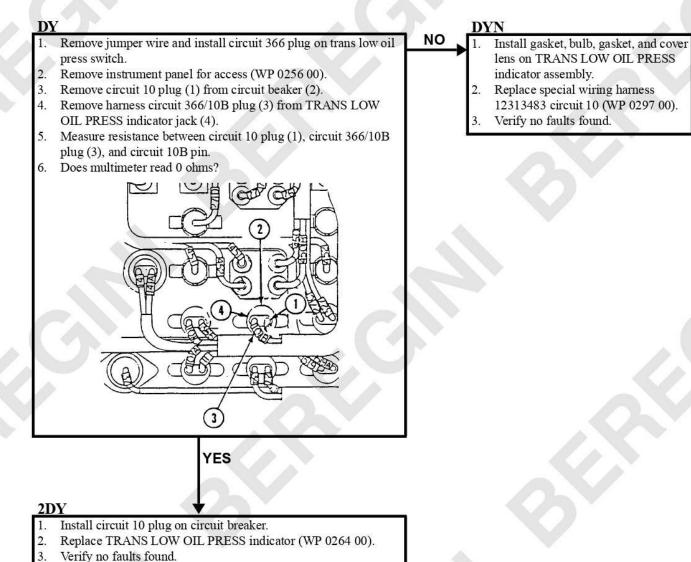
2CYN

NO

- Remove jumper wire and install circuit 366 plug on trans low oil press switch.
- Replace TRANS LOW OIL PRESS indicator assembly (WP 0264 00).
- 3. Verify no faults found.

3CY

- 1. Replace faulty wiring harness 12313483.
- Notify your supervisor.





HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A1)

0056 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Jumper Wire

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

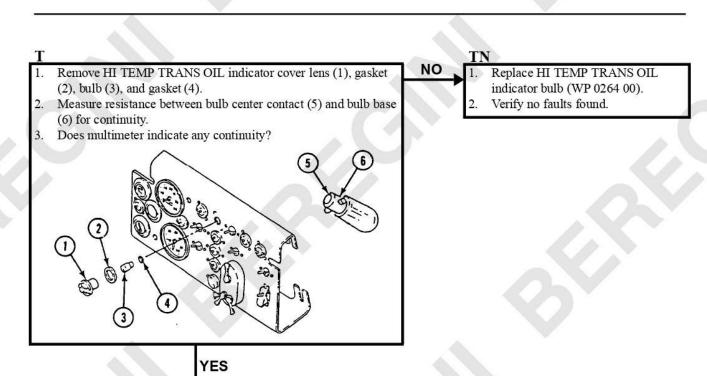
Engine stopped (see your -10)

Carrier blocked (see your -10)

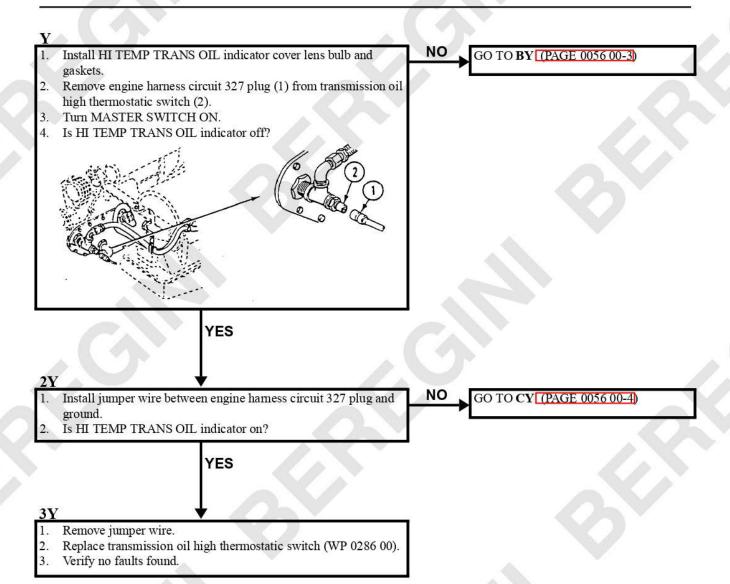
Engine and transmission cooled down

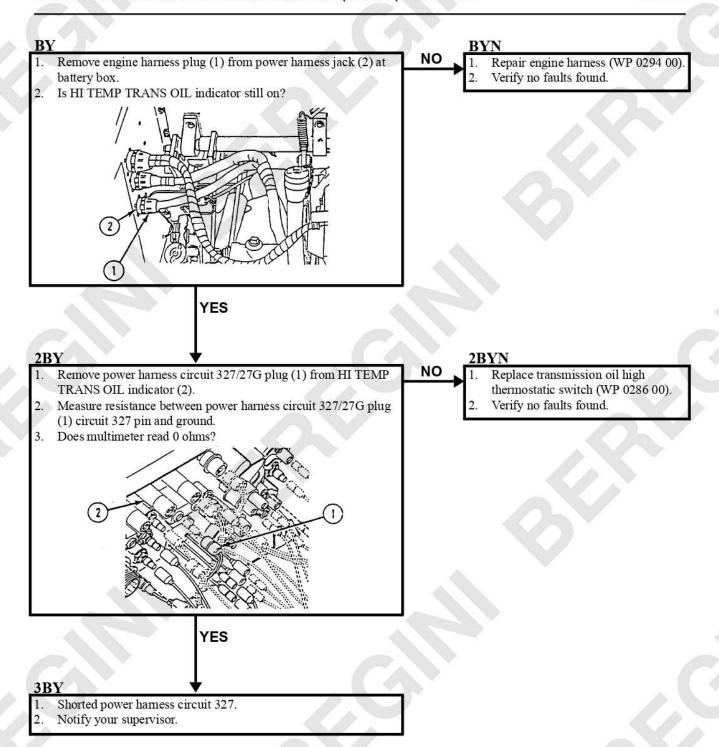
Center seat raised (see your -10)

Power plant rear access door removed (see your -10)

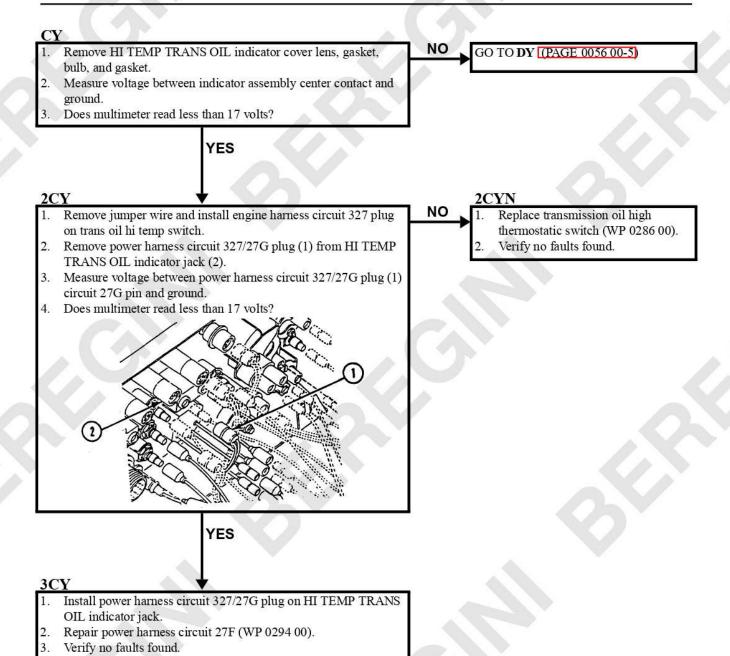


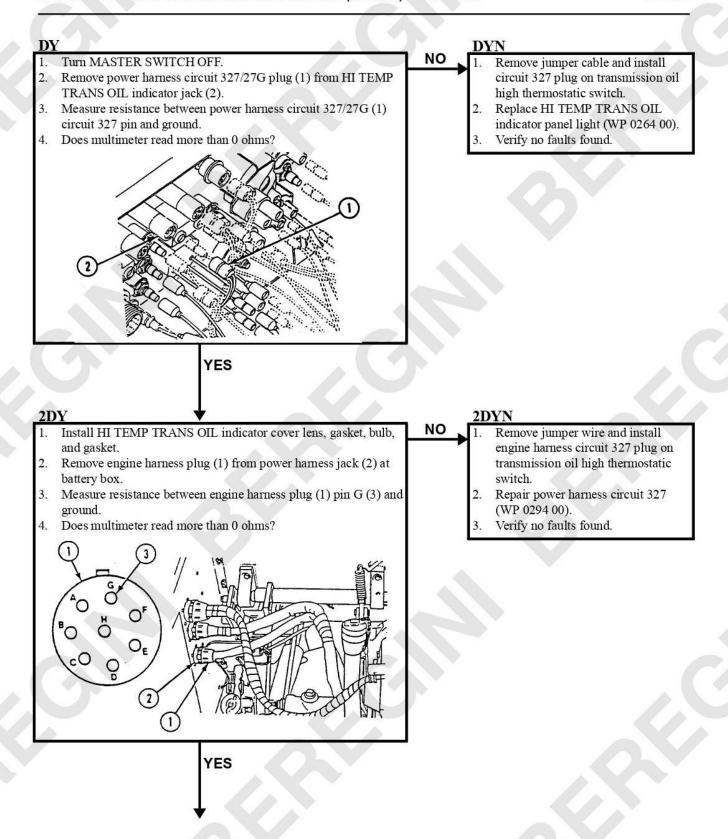
HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A1)—Continued





HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A1)—Continued





TM 9-2350-247-20-1

HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A1)—Continued

0056 00

3DY

- 1. Install power harness circuit 327/27G plug on HI TEMP TRANS OIL indicator. Repair engine harness circuit 327 (WP 0294 00).
- Verify no faults found.

HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A3)

0057 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Jumper Wire

Personnel Required

Unit Mechanic

References

See your -10

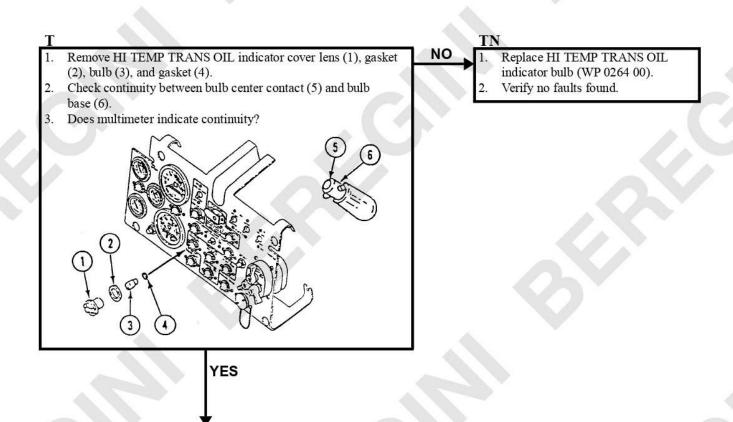
Equipment Condition

Engine stopped (see your -10)

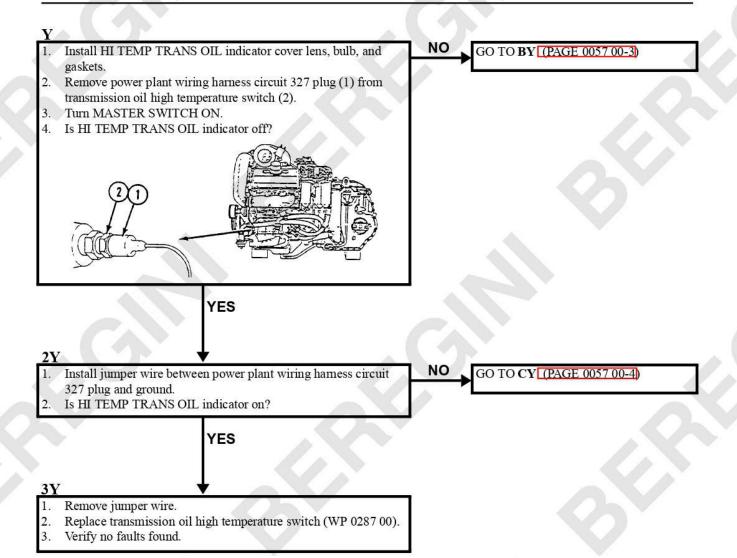
Carrier blocked (see your -10)

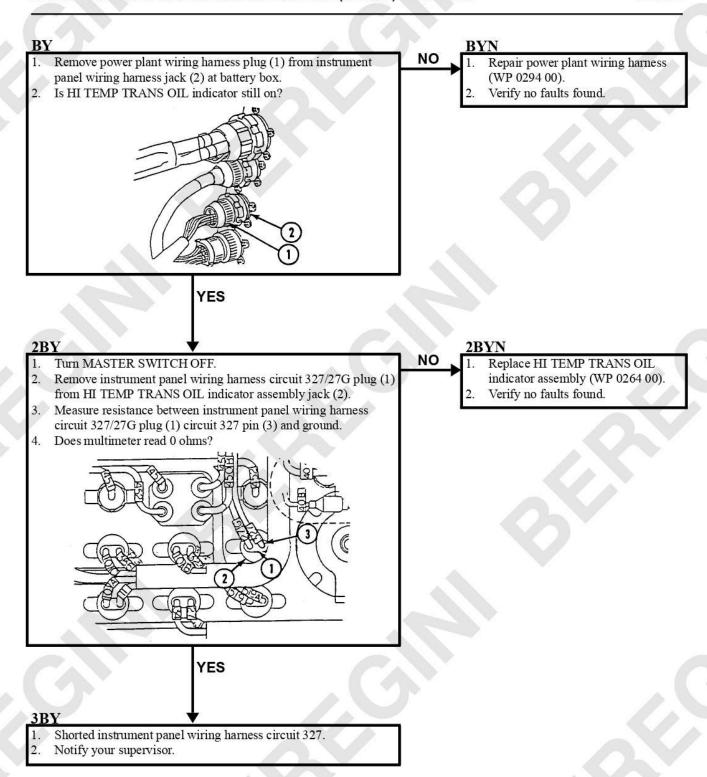
Center seat raised (see your -10)

Cab floor plates removed (WP 0250 00)

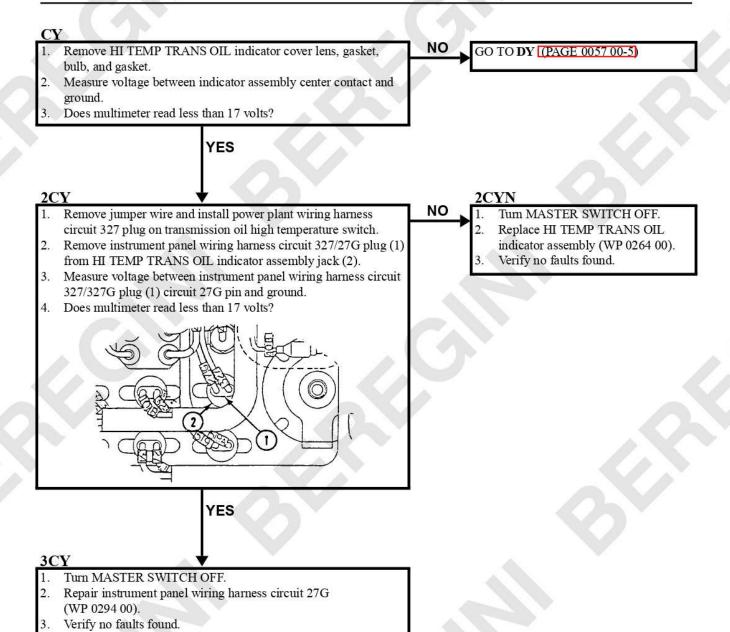


HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A3)—Continued

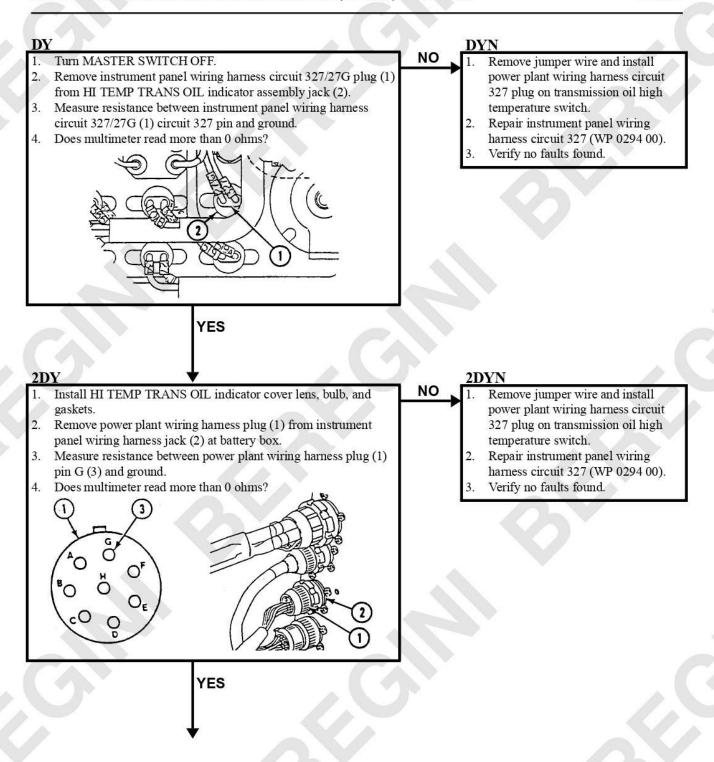




HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A3)—Continued



HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A3)—Continued



TM 9-2350-247-20-1

HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A3)—Continued

0057 00

3DY

- 1. Install instrument panel wiring harness circuit 327/27G plug on HI TEMP TRANS OIL indicator. Repair power plant wiring harness circuit 327 (WP 0294 00).
- Repair power plant wir
 Verify no faults found.

HI TEMP DIFF OIL INDICATOR MALFUNCTIONS (M548A1)

0058 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

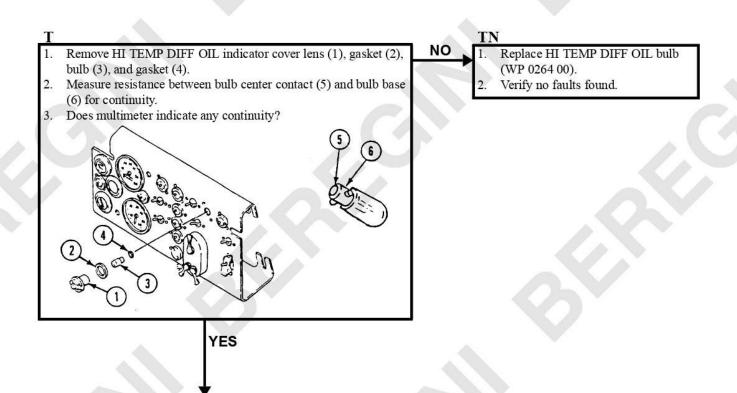
Personnel Required

Unit Mechanic

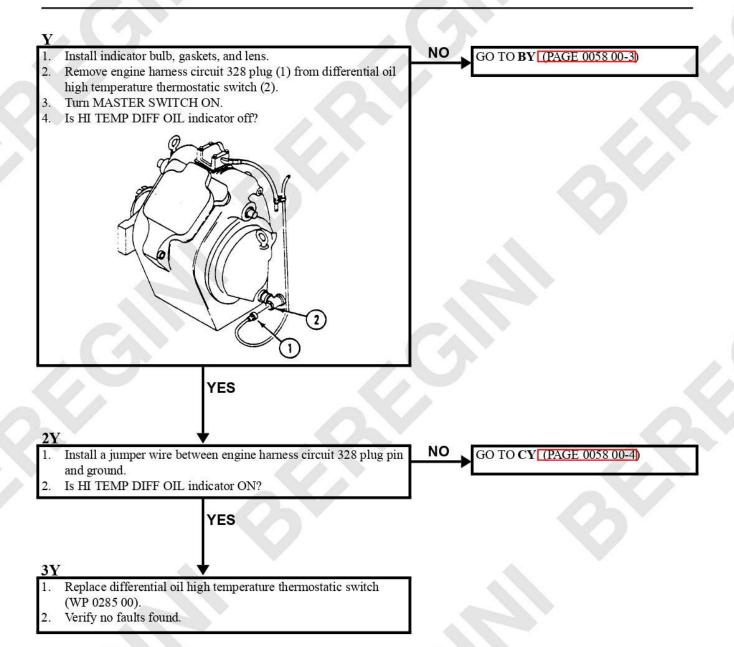
Equipment Condition

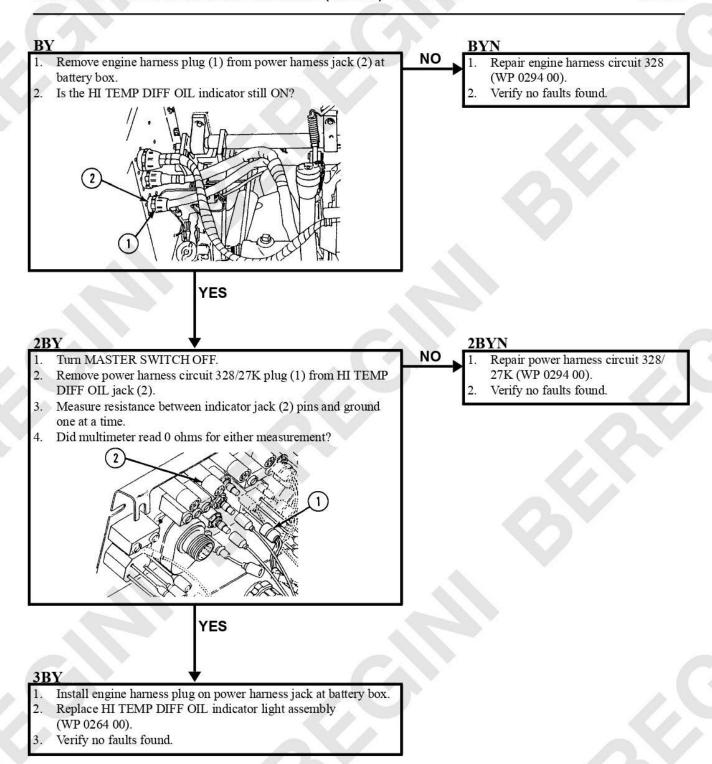
Engine stopped (see your -10) Carrier blocked (see your -10)

Center seat raised (see your -10)

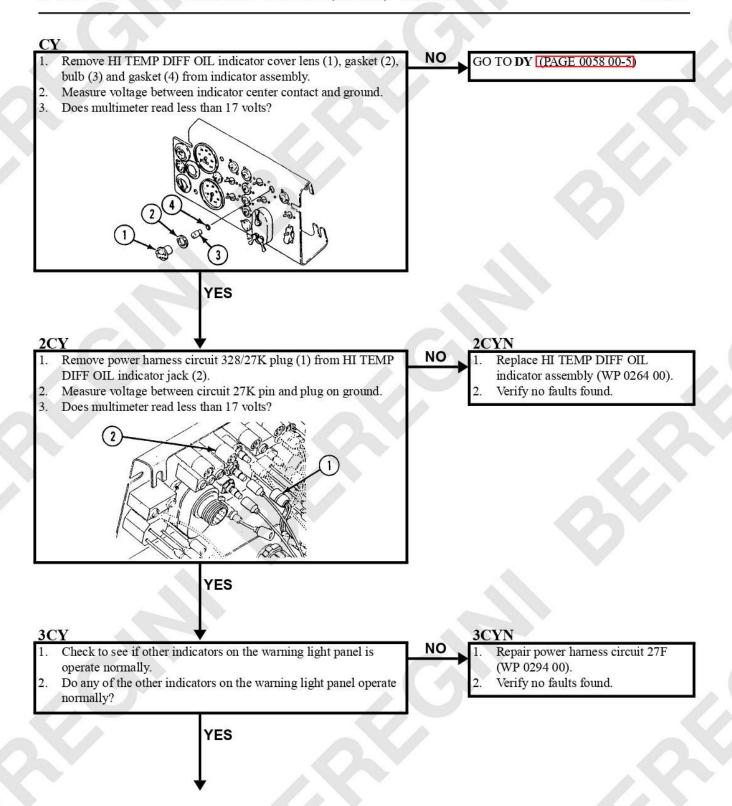


HI TEMP DIFF OIL INDICATOR MALFUNCTIONS (M548A1)—Continued





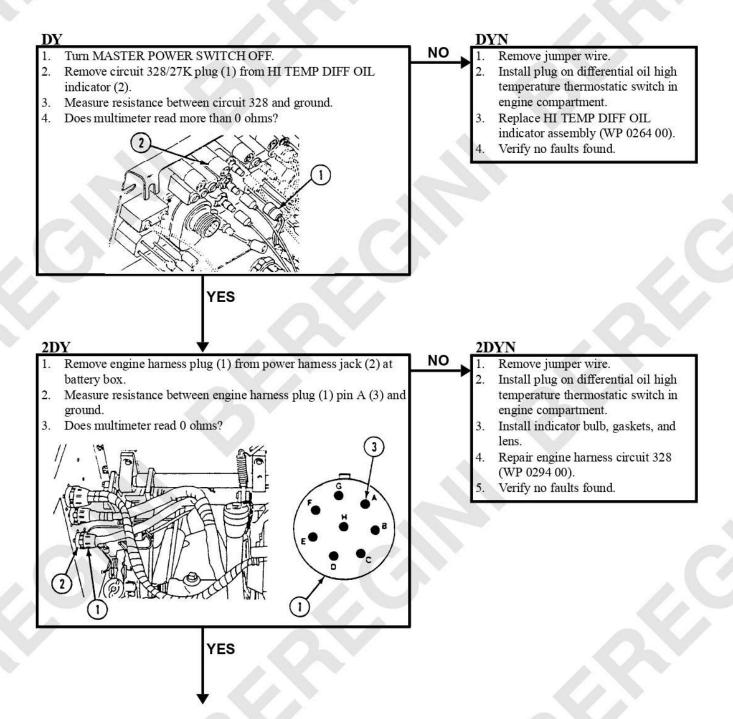
HI TEMP DIFF OIL INDICATOR MALFUNCTIONS (M548A1)—Continued



0058 00

4CY

- 1. Repair power harness circuit 27K (WP 0294 00).
- 2. Verify no faults found.



HI TEMP DIFF OIL INDICATOR MALFUNCTIONS (M548A1)—Continued

005800

3DY

- Remove jumper wire.
- Install plug on HI TEMP DIFF OIL indicator assembly. Repair power harness circuit 328 (WP 0294 00).
- Verify no faults found.

TRANS OIL HI DIFF PRESS INDICATOR MALFUNCTIONS (M548A3)

0059 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Jumper Wire

Personnel Required

Unit Mechanic

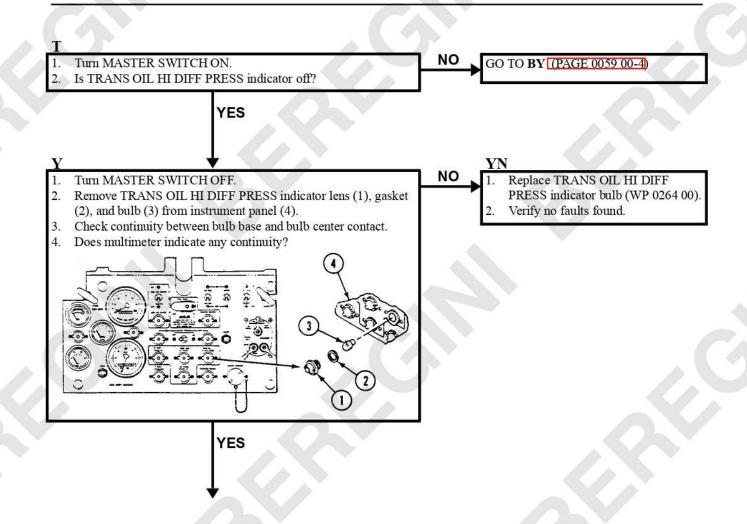
Helper (H)

Equipment Condition

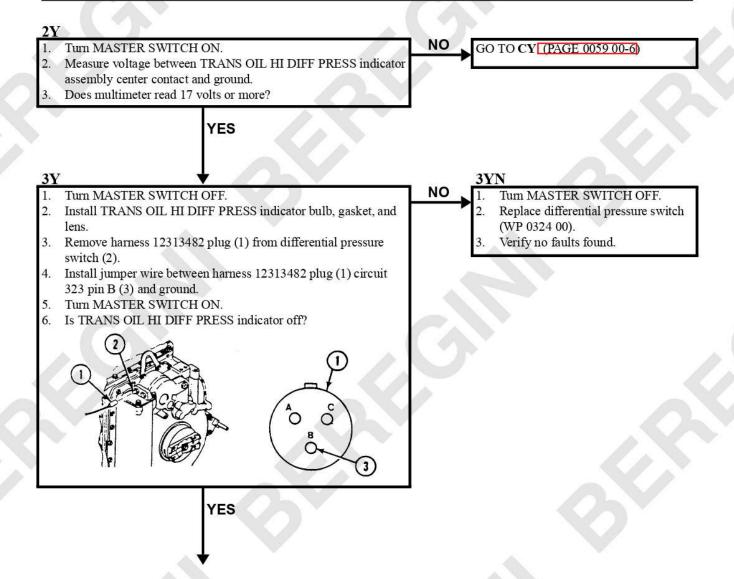
Engine stopped (see your -10)

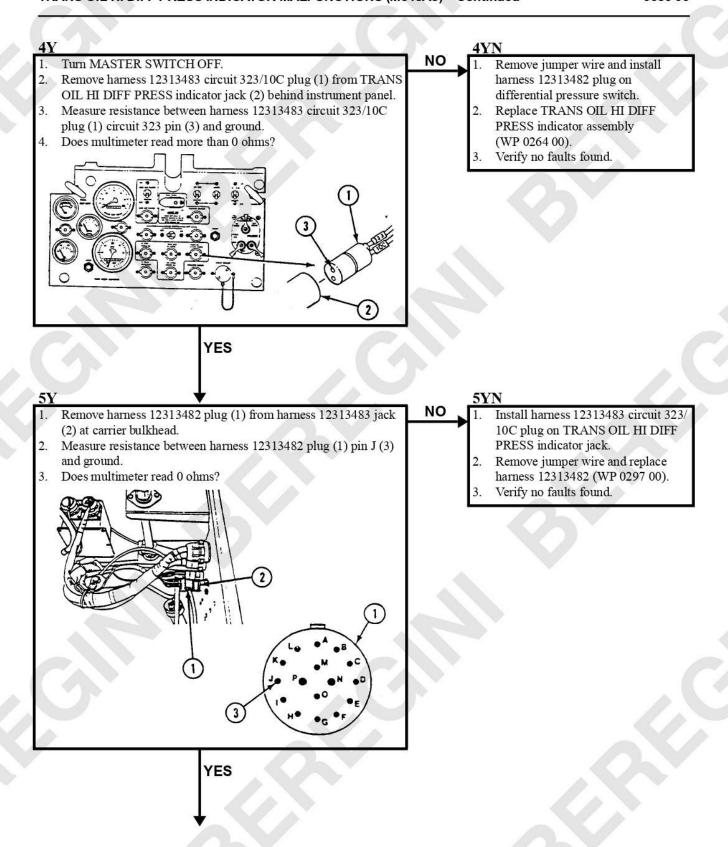
Carrier blocked (see your -10)

Center seat and driver's seat raised (see your -10)



TRANS OIL HI DIFF PRESS INDICATOR MALFUNCTIONS (M548A3)—Continued



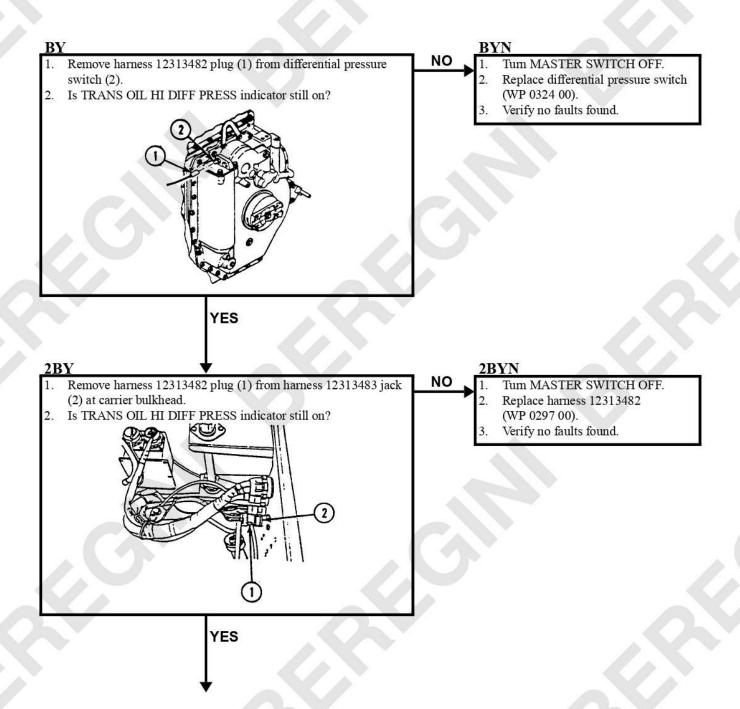


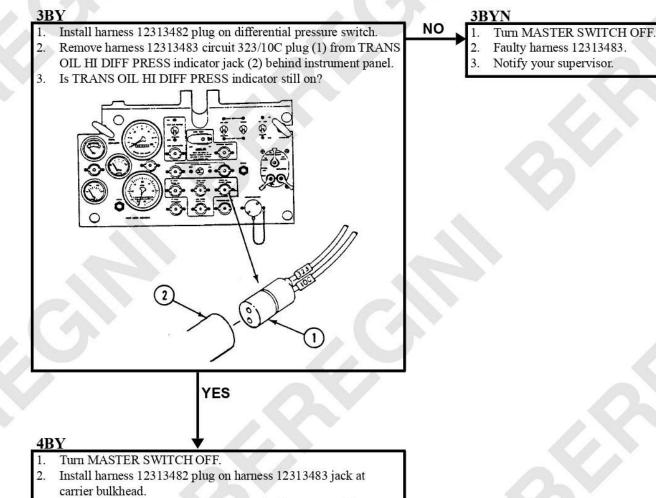
TRANS OIL HI DIFF PRESS INDICATOR MALFUNCTIONS (M548A3)—Continued

005900

6Y

- 1. Remove jumper wire and install hamess 12313482 plug on differential pressure switch.
- 2. Faulty harness 12313483 circuit 323.
- 3. Notify your supervisor.

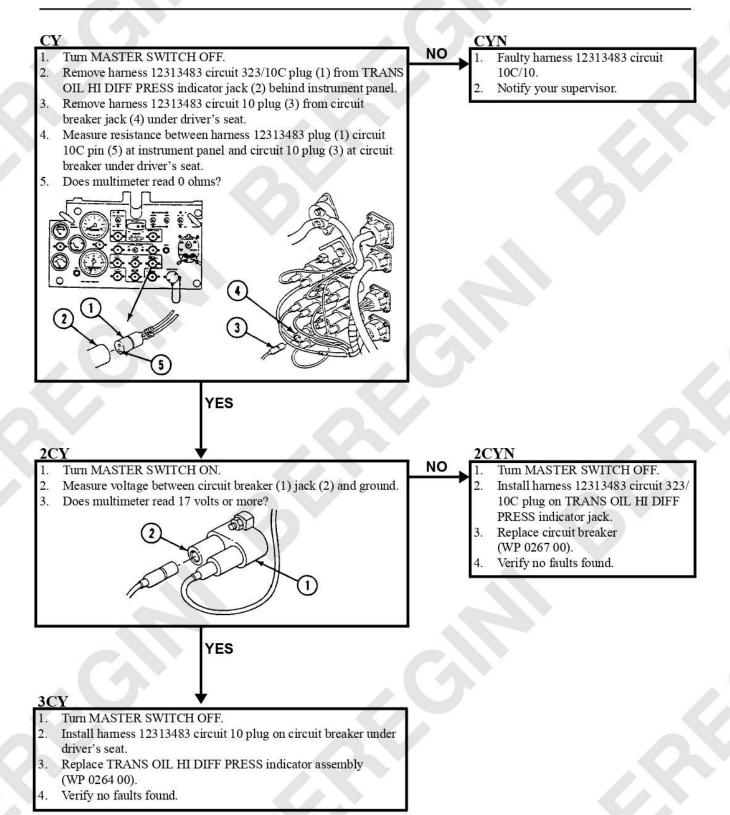




Replace TRANS OIL HI DIFF PRESS indicator assembly

(WP 0264 00). Verify no faults found.

TRANS OIL HI DIFF PRESS INDICATOR MALFUNCTIONS (M548A3)—Continued



WINDSHIELD WIPER DOES NOT OPERATE

0060 00

INITIAL SETUP:

Maintenance Level

Unit

References
See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

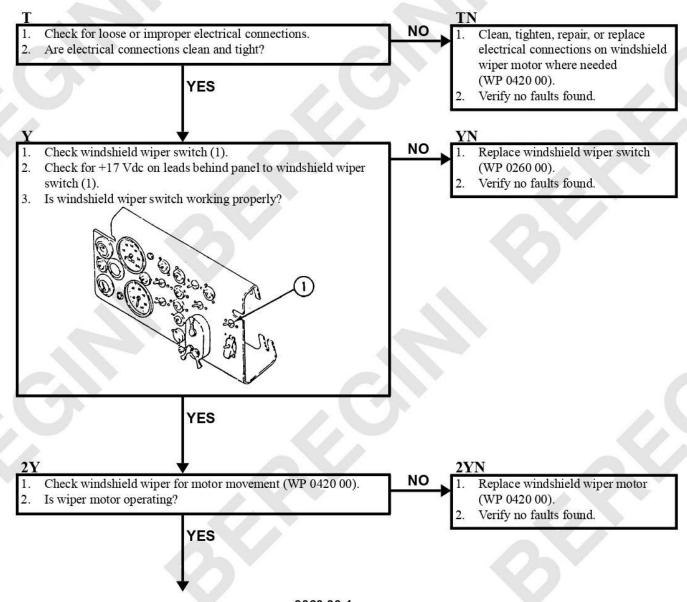
Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.



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WINDSHIELD WIPER DOES NOT OPERATE—Continued

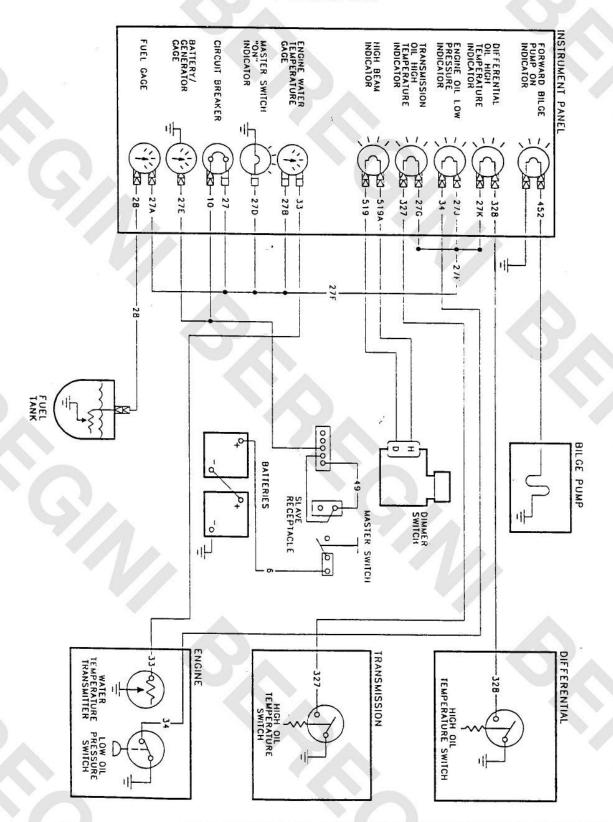
- Repair windshield wiper linkage (WP 0421 00). Verify no faults found.

00 1900

(N548A1) INSTRUMENT PANEL INDICATORS SCHEMATIC (M548A1)

DESCRIPTION

MilitaryManuals.Com



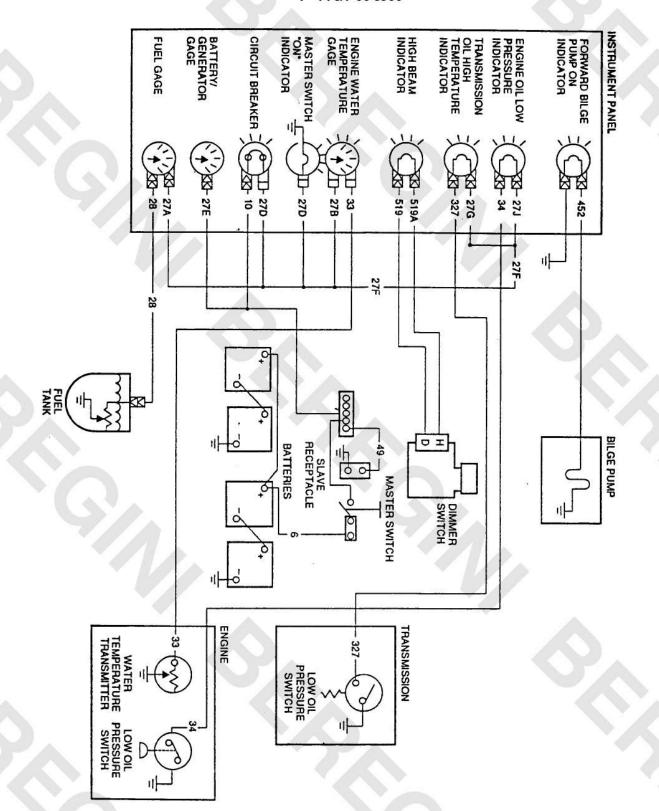
0061 00-1/2 blank



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INSTRUMENT PANEL INDICATORS SCHEMATIC (M548A3) (SHEET 1 OF 2)

DESCRIPTION



0062 00-1/2 blank

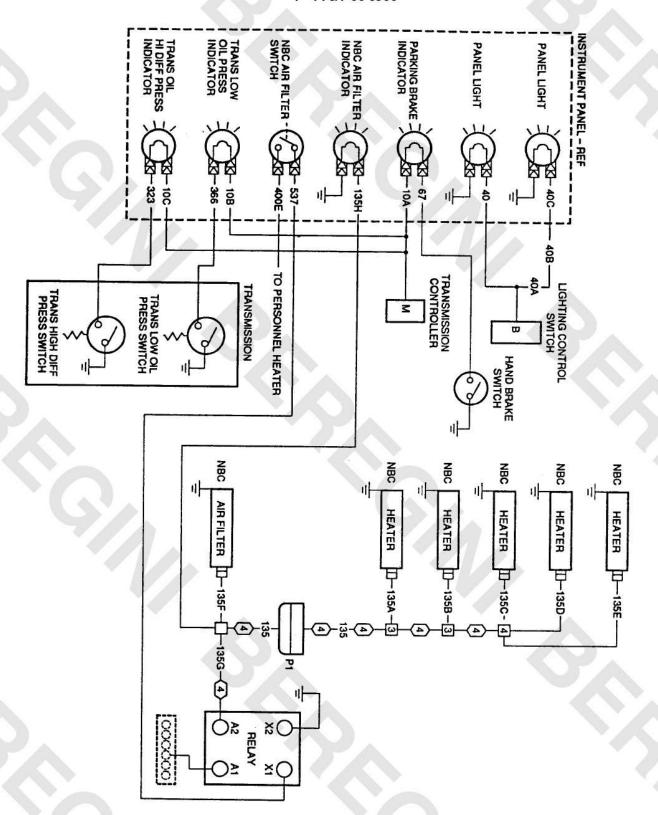


00 8900

INSTRUMENT PANEL INDICATORS SCHEMATIC (M548A3) (SHEET 2 OF 2)

DESCRIPTION

MilitaryManuals.Com



0063 00-1/2 blank



ELECTRICAL SYSTEM SCHEMATIC

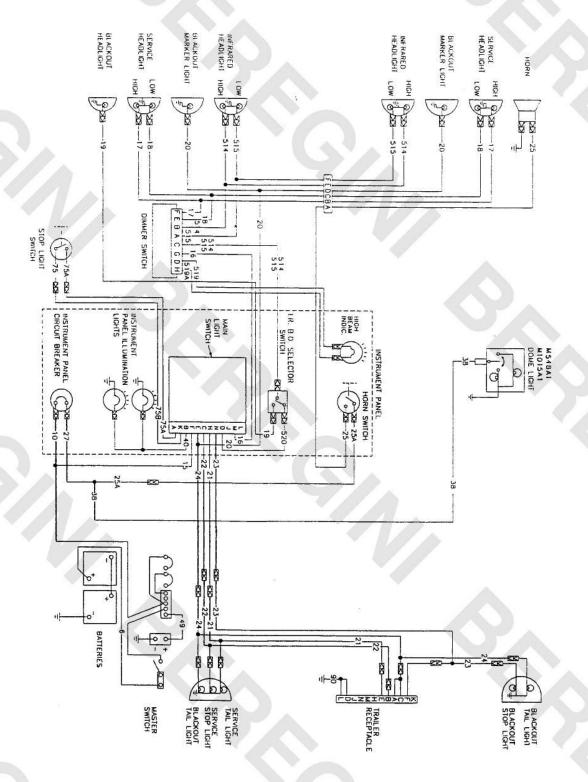
0064 00

DESCRIPTION

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HOTE

MS48A1 has two datteries. MS48A3 has four datteries.



2-00 4900

0065 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

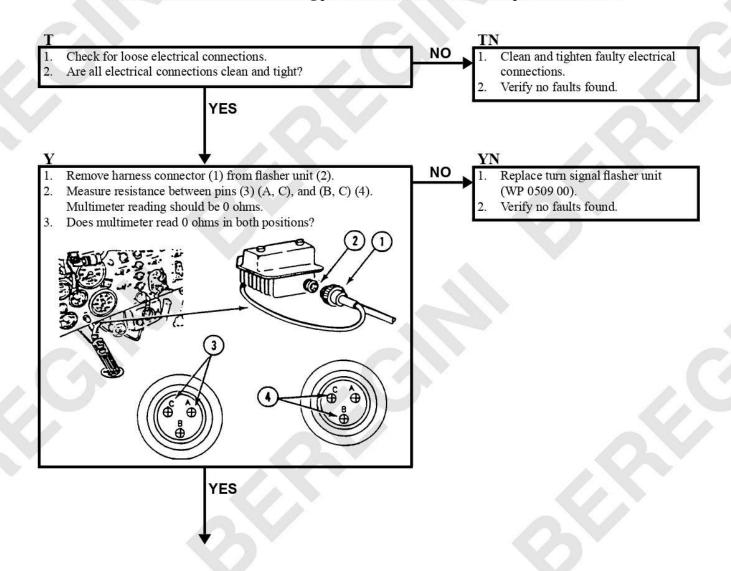
Equipment Condition

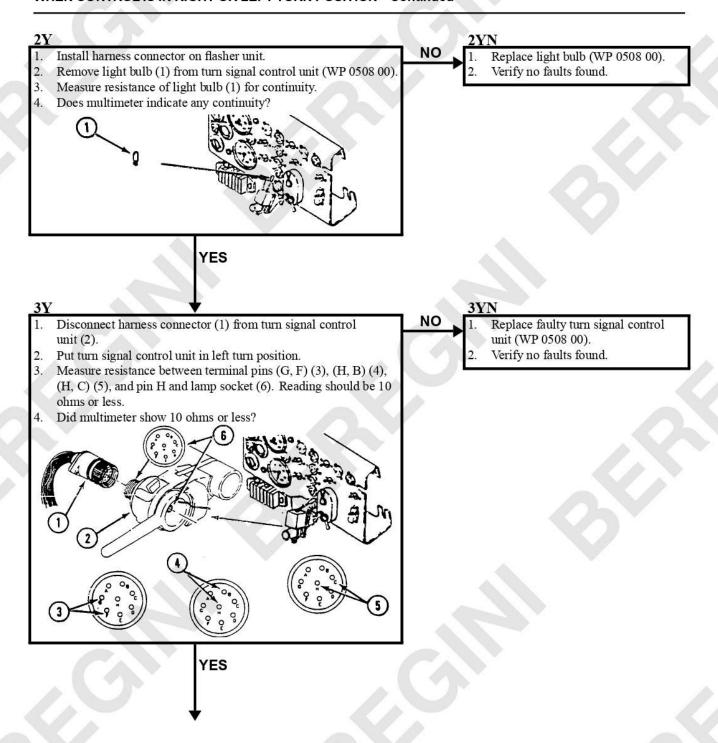
Engine stopped (see your -10) Carrier blocked (see your -10)

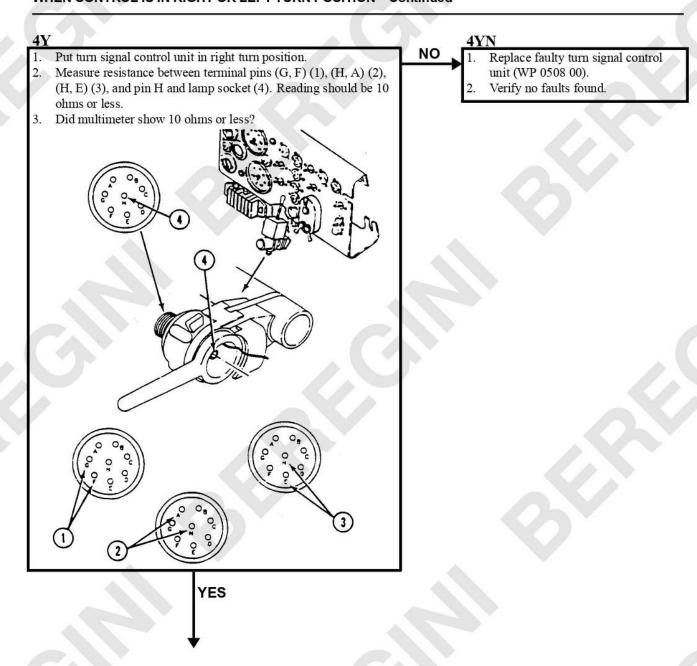
MASTER SWITCH OFF (see your -10)

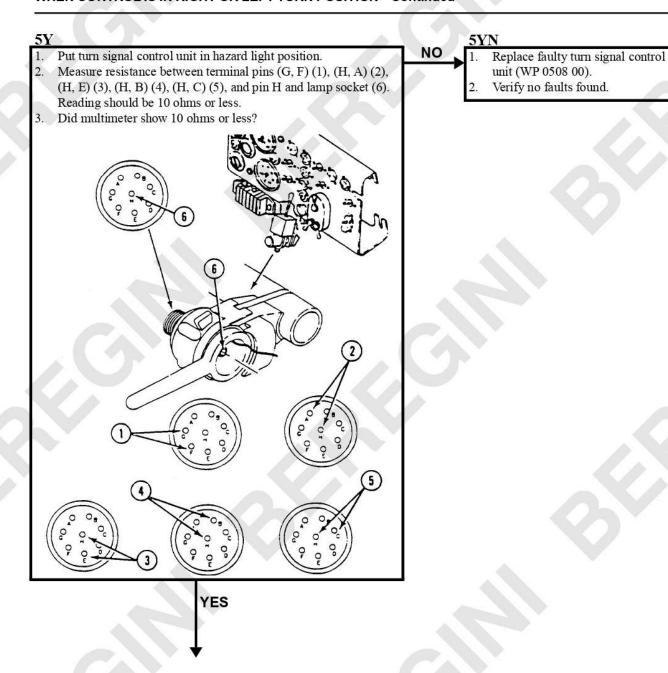
NOTE

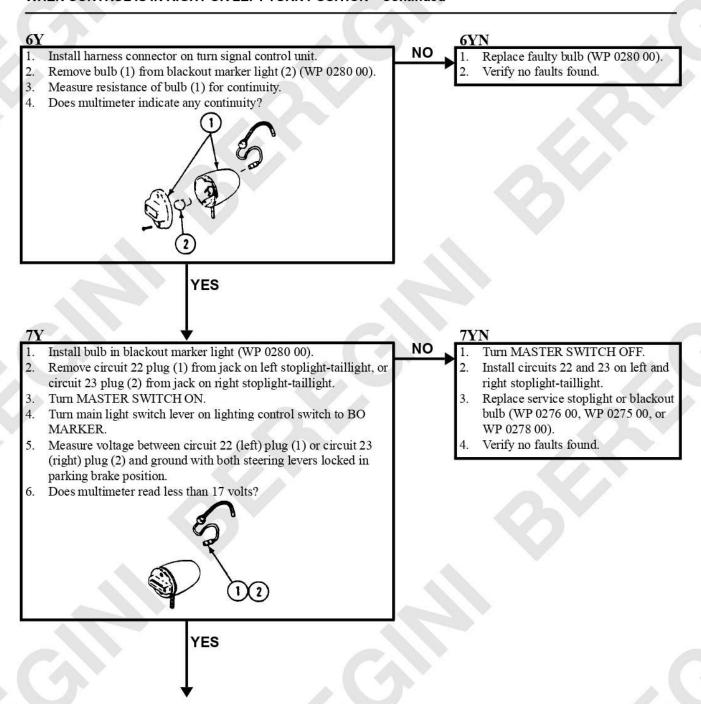
M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

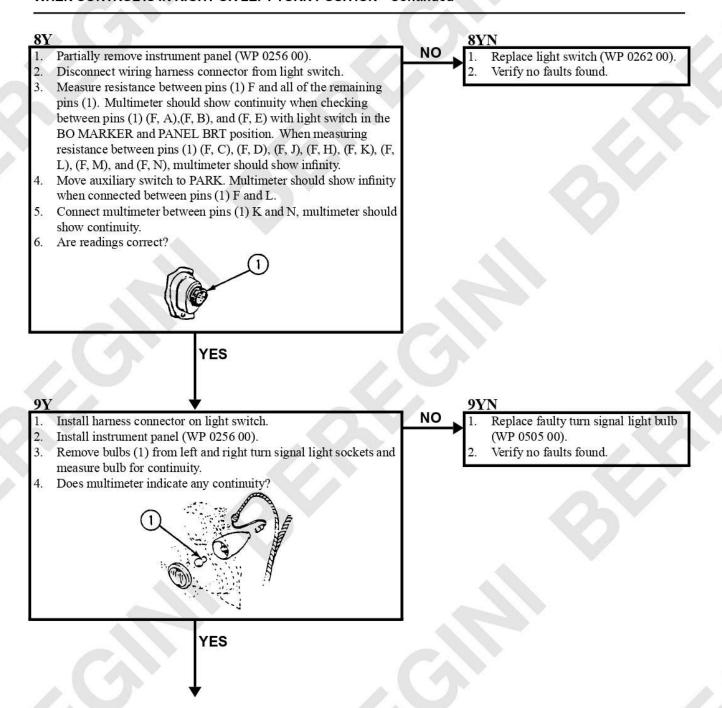


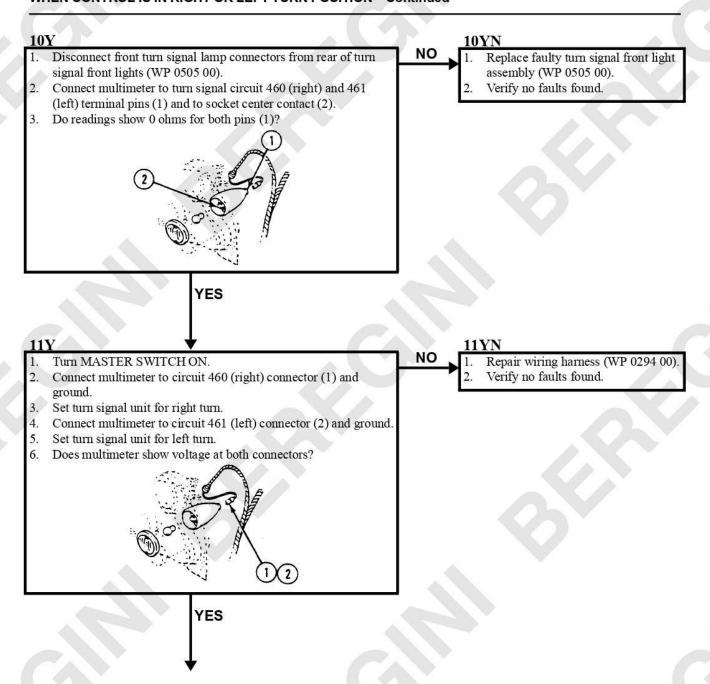


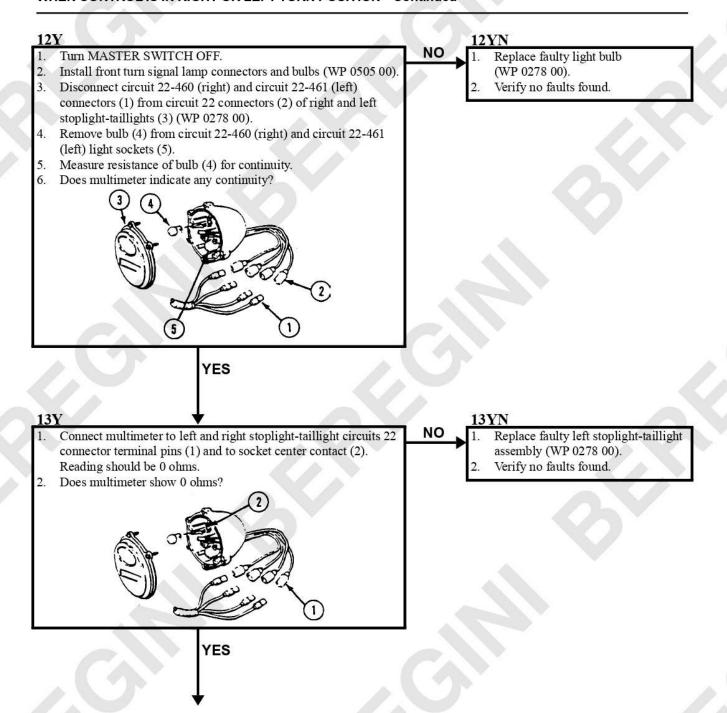




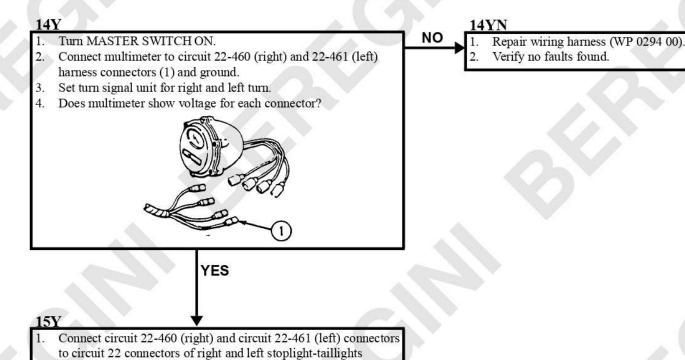








0065 00



(WP 0278 00). Verify no faults found.



0066 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

Personnel Required

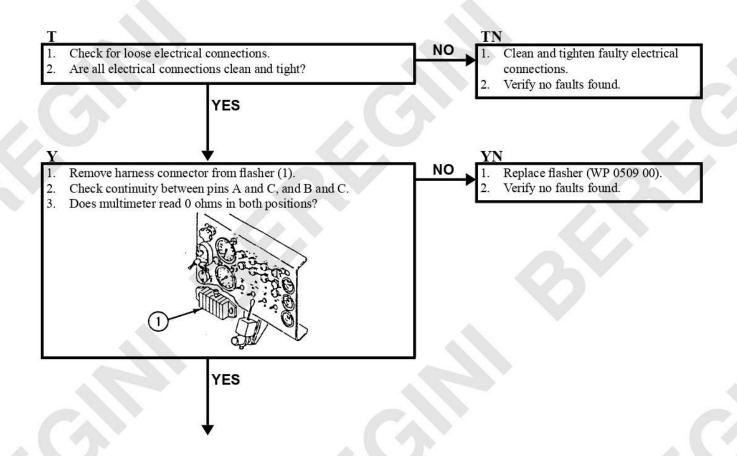
Unit Mechanic

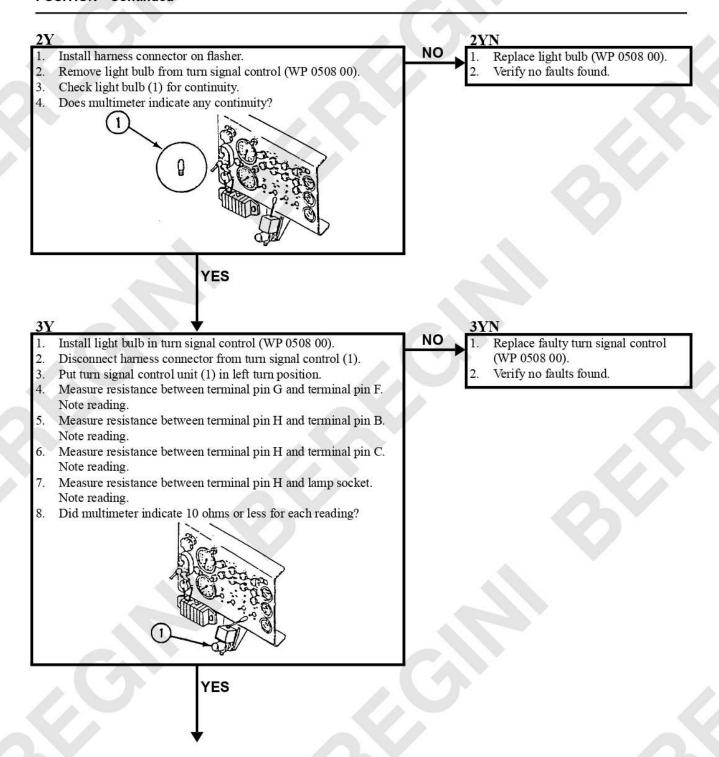
Equipment Condition

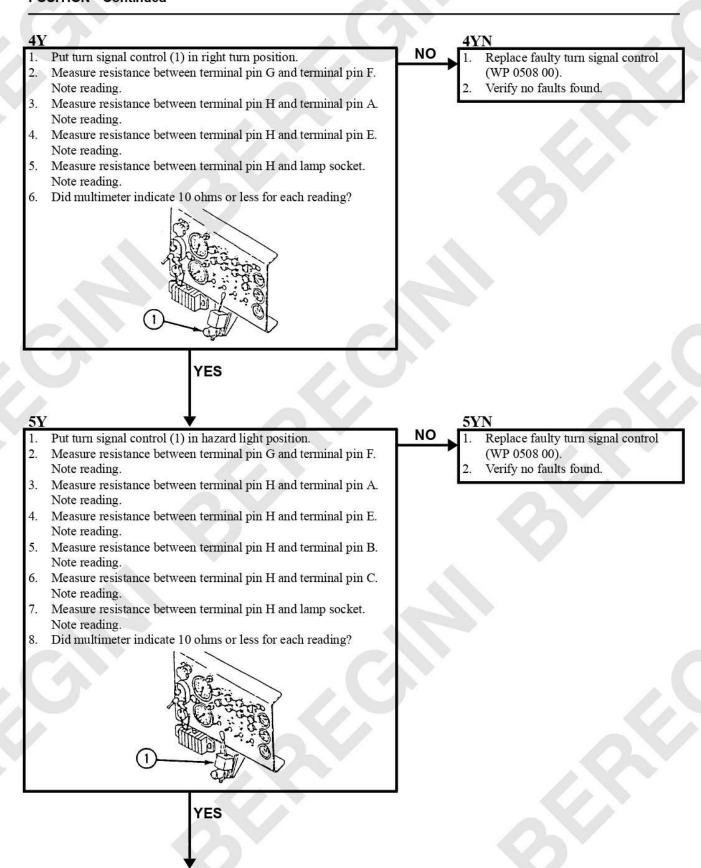
Engine stopped (see your -10)

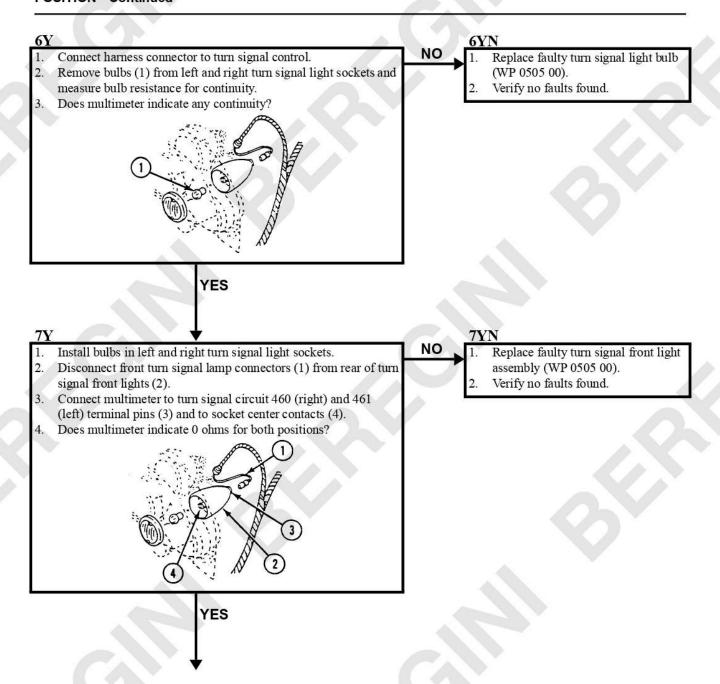
Carrier blocked (see your -10)

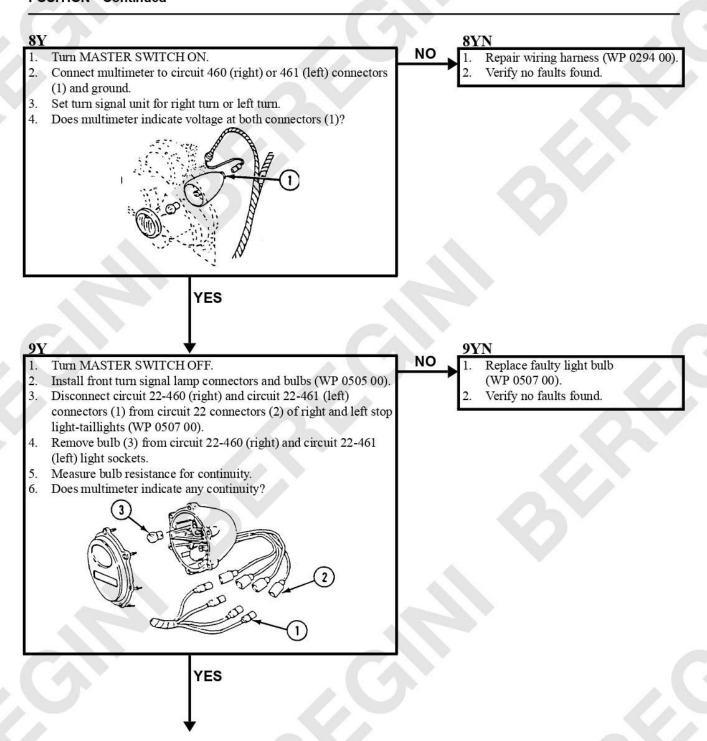
MASTER SWITCH OFF (see your -10)

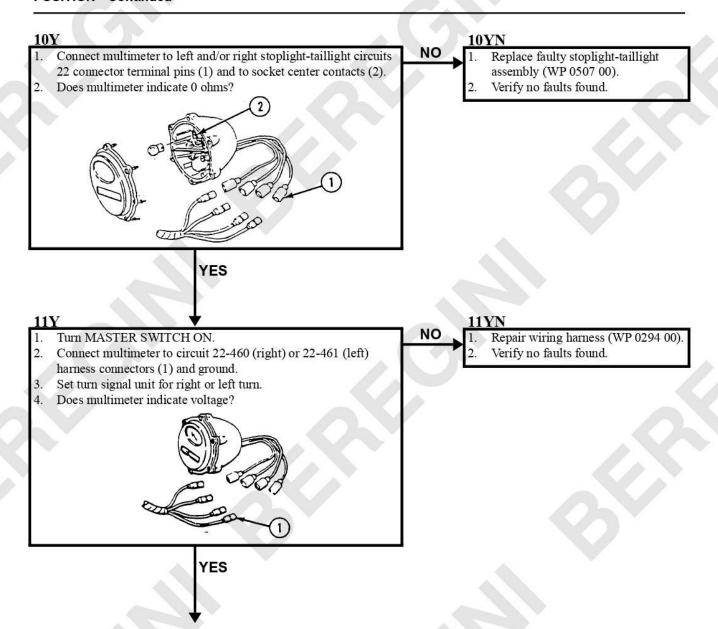




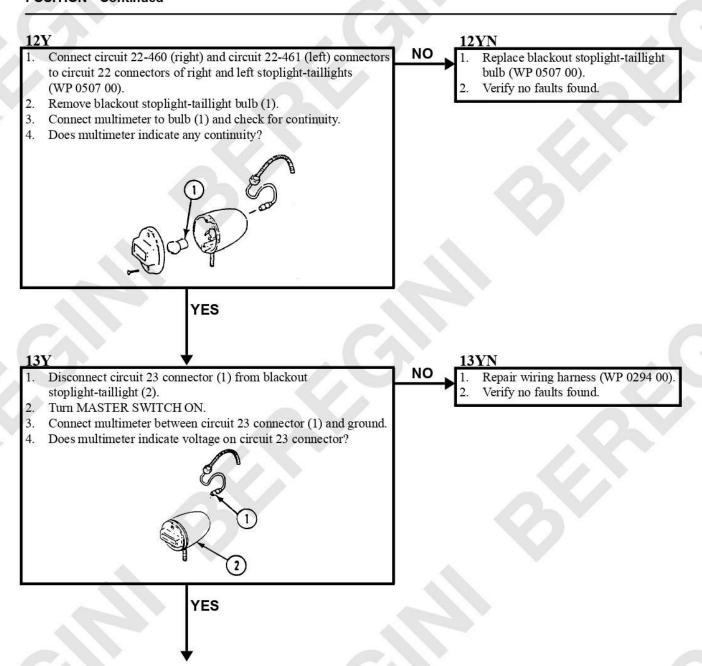








TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued



TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued

006600

14Y

- Install light bulb and connect circuit 23 connector to blackout stoplight-taillight.
- 2. Partially remove instrument panel (WP 0256 00).
- 3. Disconnect wiring harness connector from light switch.
- 4. Place light switches in STOP LIGHT and PANEL BRT positions.
- 5. Check continuity between pin F and all remaining pins (1). Multimeter should indicate continuity when checking between pins (F, A), (F, B), and (F, J). When checking pins (F, C), (F, D), (F, E), (F, H), (F, K), (F, L), (F, M), and (F, N), multimeter should indicate infinity.
- Move auxiliary switch to PARK. Multimeter should indicate infinity when connected between pins F and L.
- Connect multimeter between pins K and C. Multimeter should read continuity.
- 8. Are readings correct?



YES

15Y

- Connect wiring harness connector to light switch.
- 2. Install instrument panel (WP 0256 00).
- 3. Verify no faults found.

14YN

NO

- 1. Replace light switch (WP 0262 00).
 - Verify no faults found.

IN LEFT OR RIGHT TURN SIGNAL POSITION, INDIVIDUAL LIGHT DOES NOT FLASH

0067 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

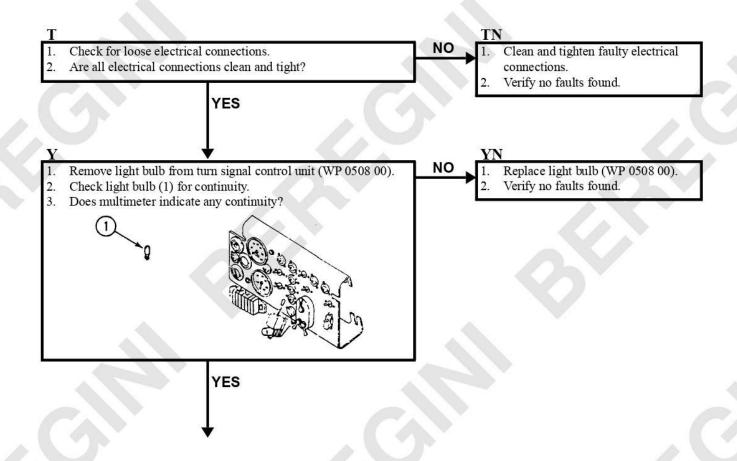
Unit Mechanic

Equipment Condition

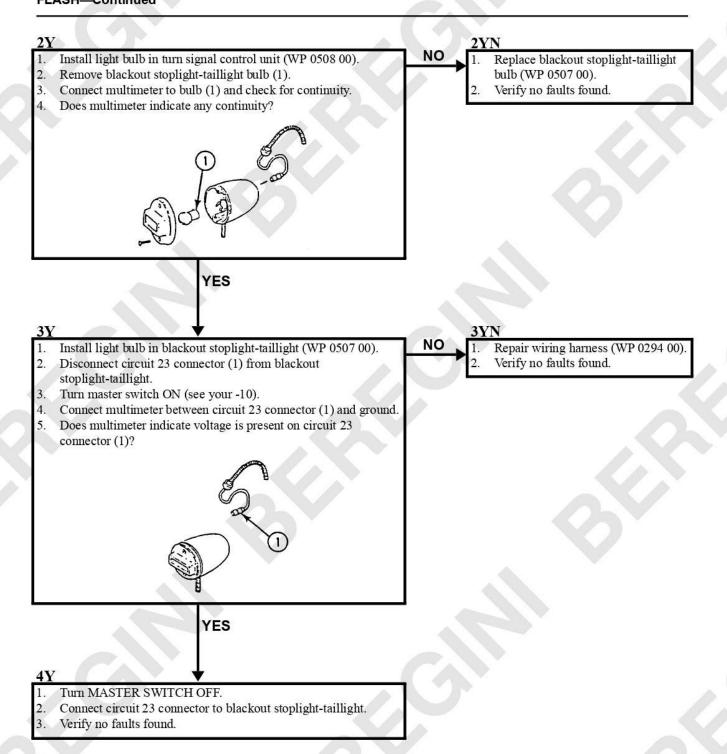
Engine stopped (see your -10)

Carrier blocked (see your -10)

MASTER SWITCH OFF (see your -10)



IN LEFT OR RIGHT TURN SIGNAL POSITION, INDIVIDUAL LIGHT DOES NOT FLASH—Continued



STEERING/BRAKES MALFUNCTION (M548A1)

0068 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

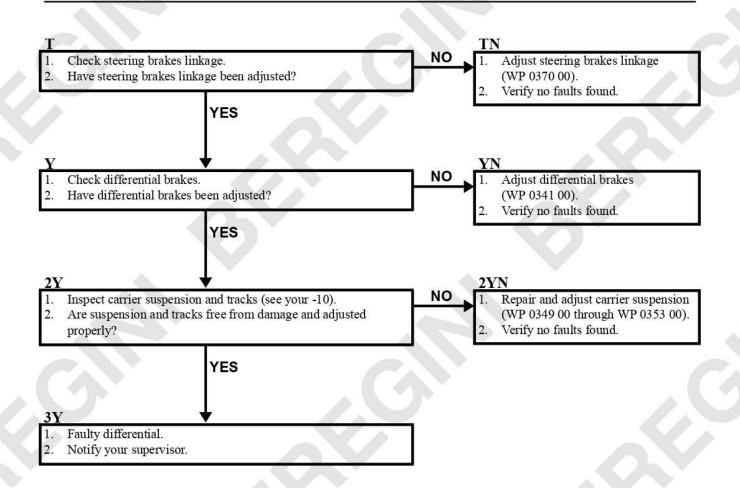
Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat raised (see your -10)

Inspect suspension (see your -10)





CARRIER DOES NOT MOVE IN ANY SHIFT LEVER POSITION (M548A1)

0069 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

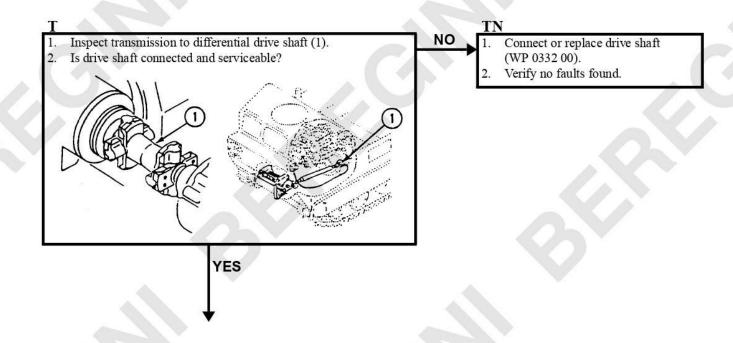
Engine stopped (see your -10)

Carrier blocked (see your -10)

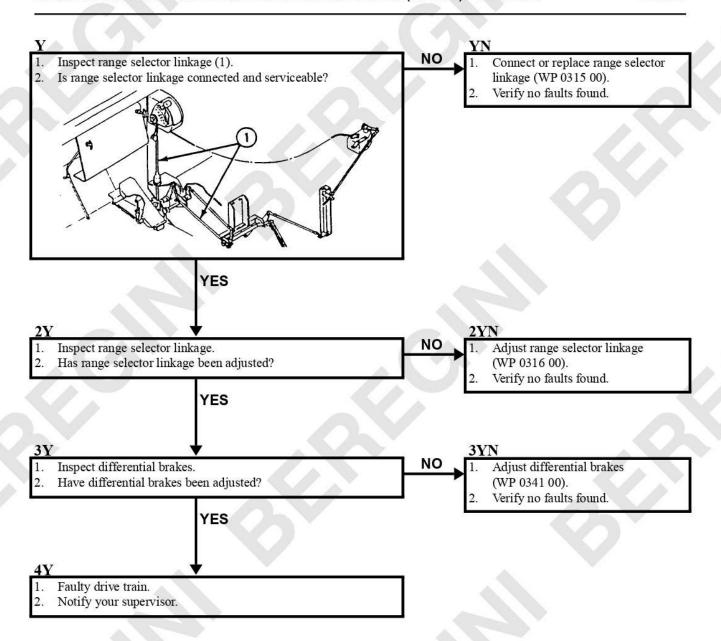
Engine disconnect lever IN (see your -10)

Center seat raised (see your -10)

Hull bottom access cover removed (WP 0383 00)



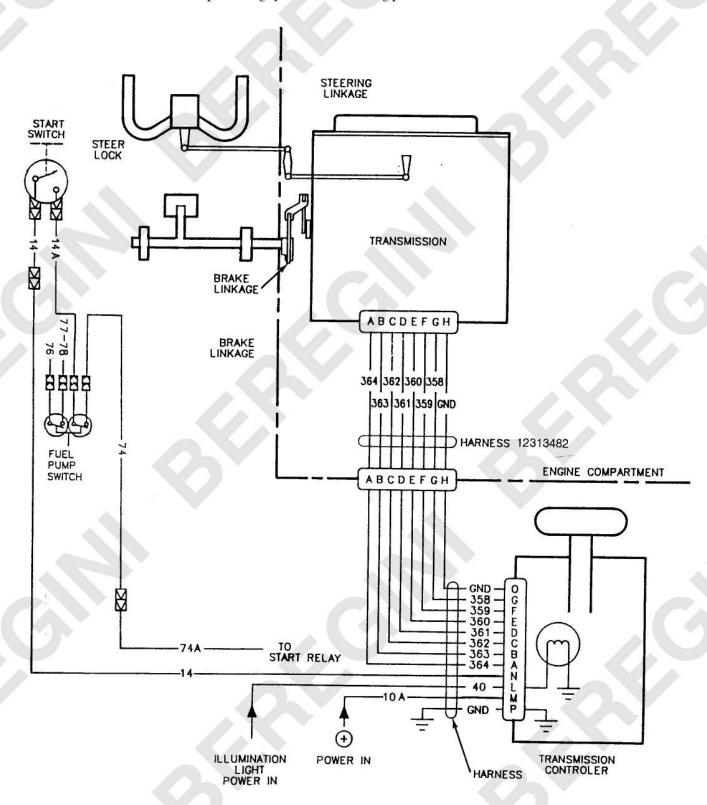
CARRIER DOES NOT MOVE IN ANY SHIFT LEVER POSITION (M548A1)—Continued



0070 00

DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.



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CARRIER DOES NOT MOVE IN ANY SHIFT LEVER POSITION (M548A3)

0071 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

Unit Mechanic

References

See your -10

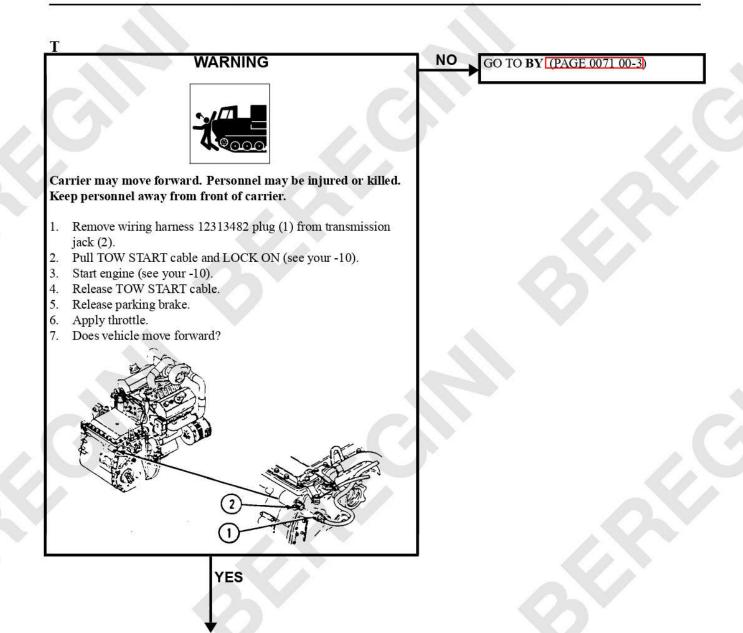
Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

Transmission oil level normal

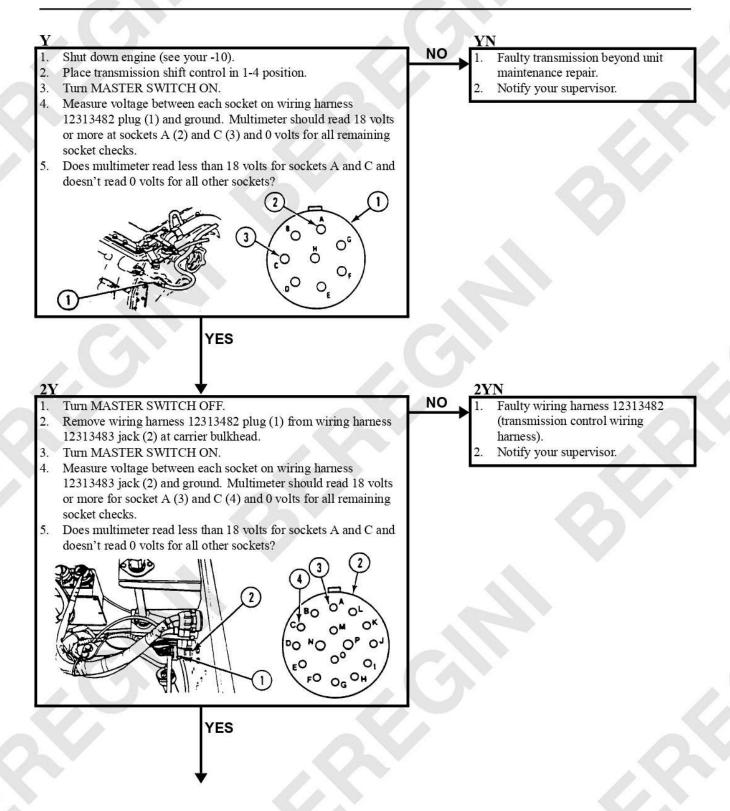
Center floor plates removed (WP 0395 00)

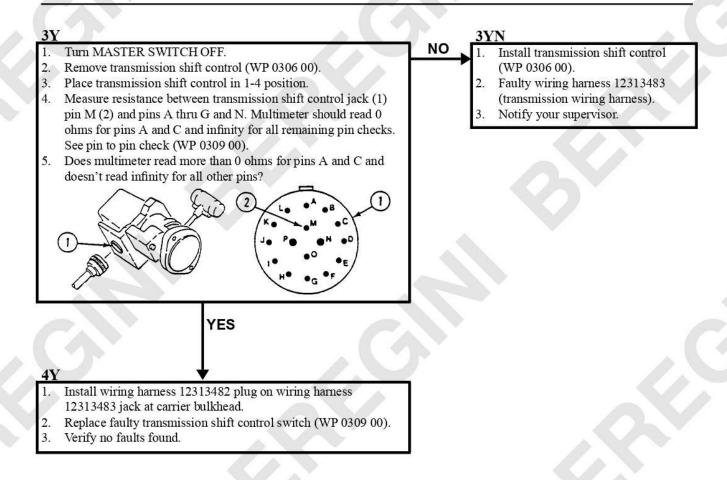
Center seat raised (see your -10)

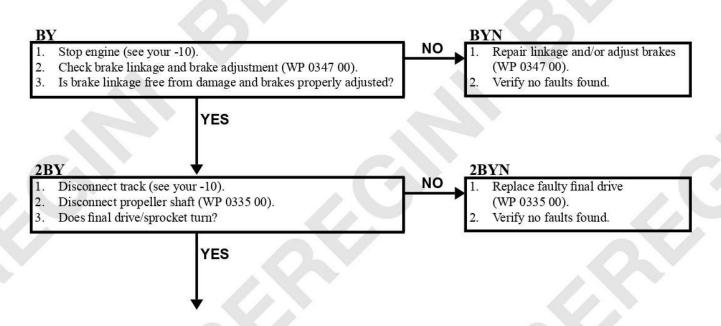


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CARRIER DOES NOT MOVE IN ANY SHIFT LEVER POSITION (M548A3)—Continued







TM 9-2350-247-20-1

CARRIER DOES NOT MOVE IN ANY SHIFT LEVER POSITION (M548A3)—Continued

0071 00

3BY

- 1. Faulty transmission beyond unit maintenance repair.
- Notify your supervisor.

CARRIER DOES NOT PIVOT (M548A1)

0072 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10 See your PMCS

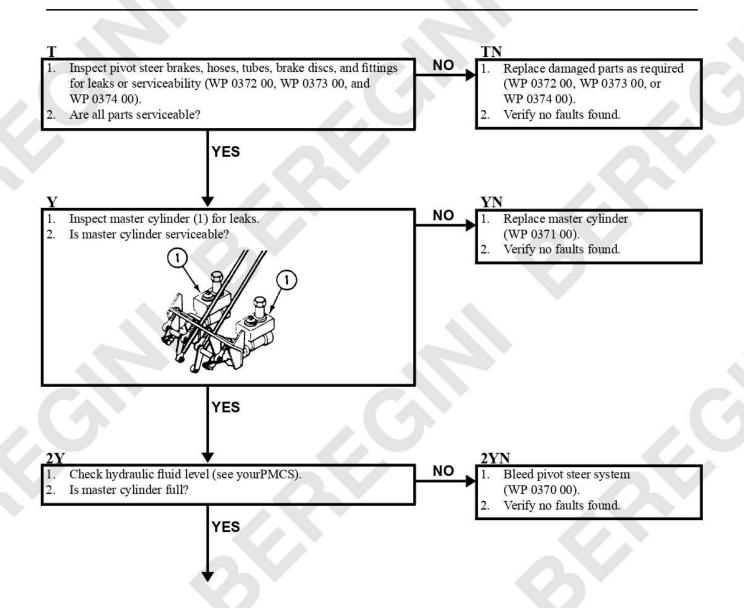
Equipment Condition

Engine stopped (see your -10)

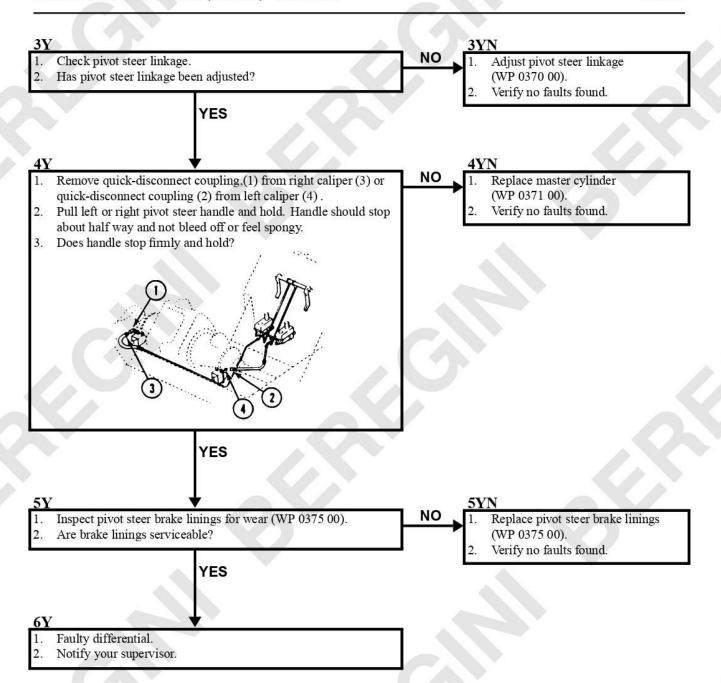
Carrier blocked (see your -10)

Center floor plates raised (WP 0394 00)

Center seat raised (see your -10)



CARRIER DOES NOT PIVOT (M548A1)—Continued



TRANSMISSION DOES NOT PIVOT STEER (M548A3)

0073 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

Unit Mechanic

Equipment Condition

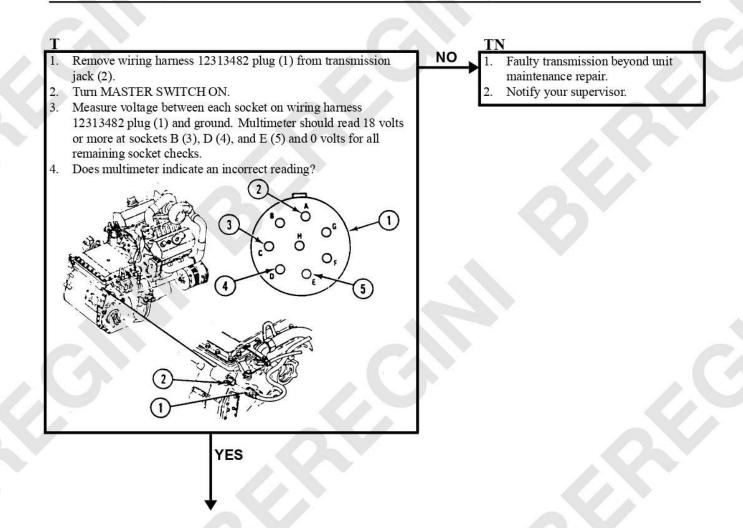
Engine stopped (see your -10)

Carrier blocked (see your -10)

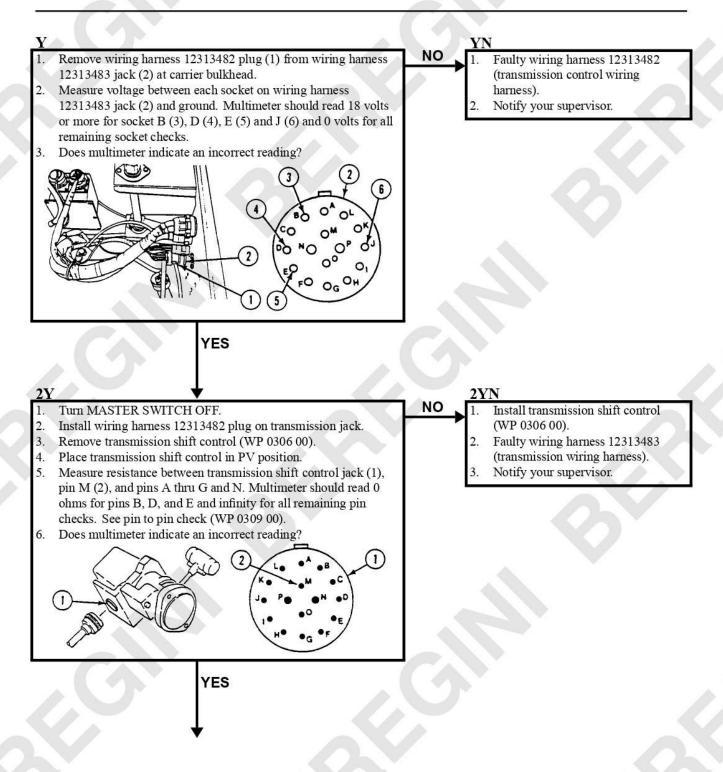
Transmission in PV position (see your -10)

Center seat raised (see your -10)

Center floor plates removed (WP 0395 00)



TRANSMISSION DOES NOT PIVOT STEER (M548A3)—Continued



TRANSMISSION DOES NOT PIVOT STEER (M548A3)—Continued

- Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.

 Replace faulty transmission shift control switch (WP 0309 00).
- Verify no faults found.



CARRIER MOVES WITH TRANSMISSION IN SL (M548A3)

0074 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

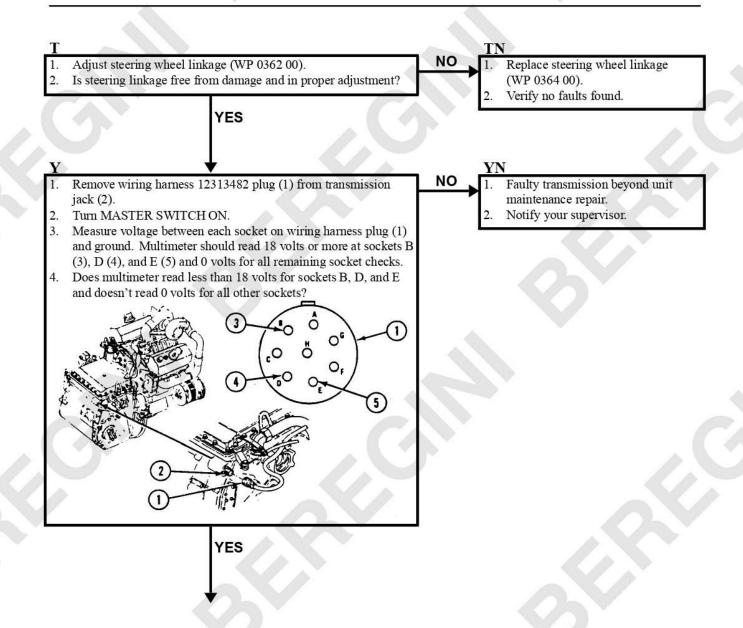
Unit Mechanic

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

Transmission in SL position (see your -10)

Cab floor plates raised (WP 0395 00)

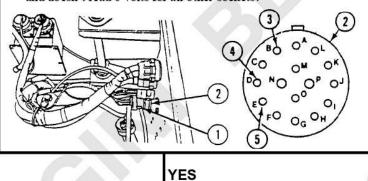


CARRIER MOVES WITH TRANSMISSION IN SL (M548A3)—Continued

007400



- 1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
- Measure voltage between each socket on wiring harness 12313483 jack (2) and ground. Multimeter should read 18 volts or more for sockets B (3), D (4), and E (5) and 0 volts for the remaining socket checks.
- 3. Does multimeter read less than 18 volts for sockets B, D, and E and doesn't read 0 volts for all other sockets?



2VN

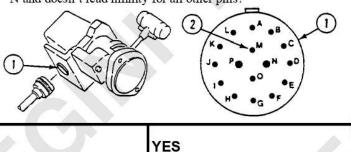
NO

- . Replace faulty wiring harness 12313482 (transmission control wiring harness) (WP 0297 00).
- Verify no faults found.

3Y

. Turn MASTER SWITCH OFF.

- 2. Install wiring harness 12313482 plug on transmission jack.
- 3. Remove transmission shift control (WP 0306 00).
- 4. Place transmission shift control in SL position.
- Measure resistance between transmission shift control jack (1) pin M (2) and pins A thru N. Multimeter should read 0 ohms for pins B, D, E, and N and infinity for all remaining pin checks. See pin to pin check (WP 0309 00).
- 6. Does multimeter read more than 0 ohms for sockets B, D, E, and N and doesn't read infinity for all other pins?



NO $\sqrt{1}$

- Install transmission shift control (WP 0306 00).
- Replace faulty wiring harness 12313483 (transmission wiring harness) (WP 0297 00).
- Verify no faults found.

CARRIER MOVES WITH TRANSMISSION IN SL (M548A3)—Continued

0074 00

4Y

- Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
 Replace faulty transmission shift control switch(WP 0309 00).
- Verify no faults found.



CARRIER DRIFTS OR DOES NOT STEER (M548A3)

0075 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

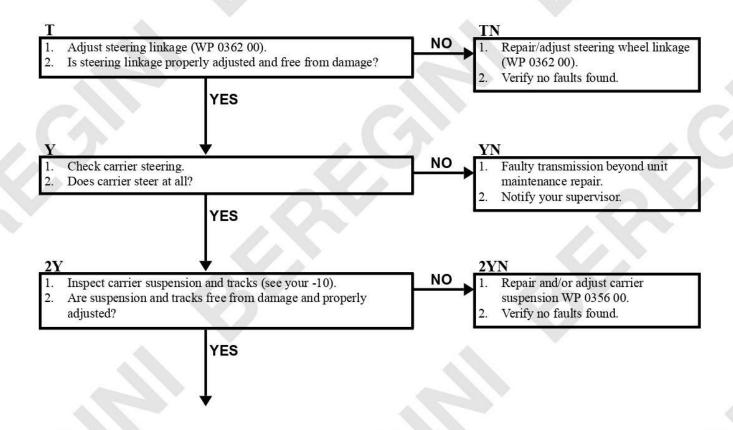
Unit Mechanic

Equipment Condition

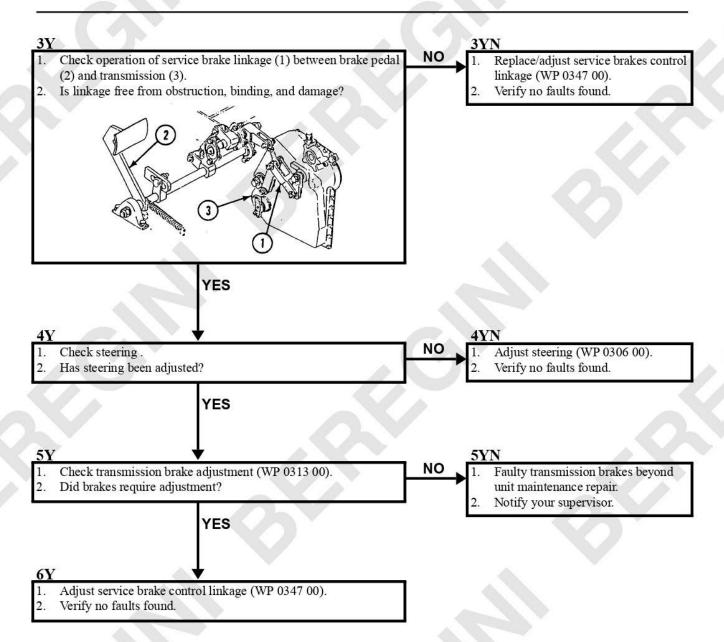
Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat raised (see your -10)



CARRIER DRIFTS OR DOES NOT STEER (M548A3)—Continued



SERVICE AND/OR PARKING BRAKE WILL NOT HOLD CARRIER (M548A3)

0076 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

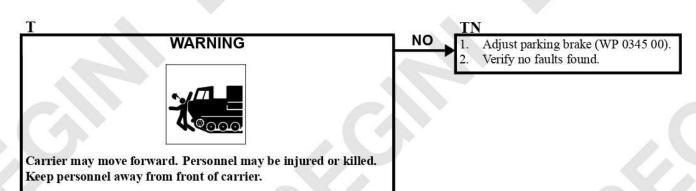
Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)

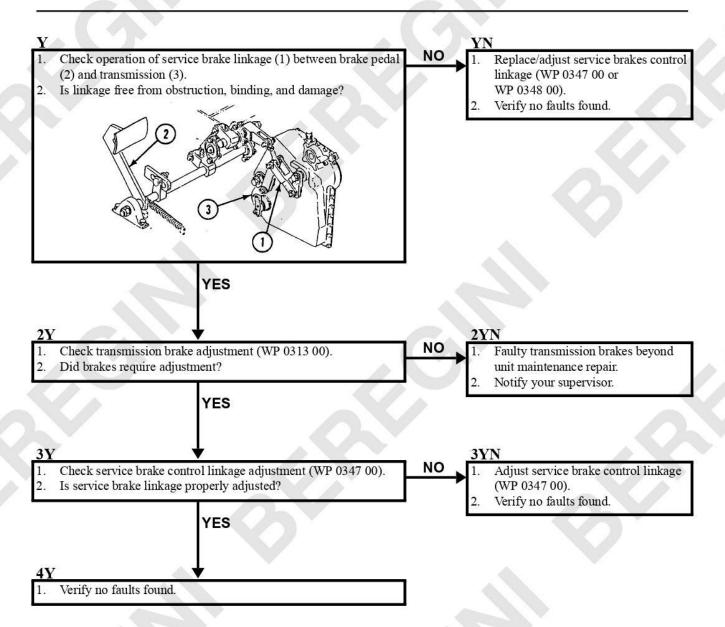
Carrier blocked (see your -10) Cab floor plates raised (WP 0395 00)



- 1. Start engine (see your -10).
- Release parking brake.
- 3. Fully depress service brake pedal.
- 4. Shift transmission selector to 1-4 positions.
- 5. Depress accelerator fully or until carrier begins to move.
- 6. Release accelerator and stop engine.
- 7. Did carrier move forward?

YES

SERVICE AND/OR PARKING BRAKE WILL NOT HOLD CARRIER (M548A3)—Continued



TRANSMISSION WILL NOT UPSHIFT OR SHIFTS ERRATICALLY IN 1-4 POSITION (M548A3)

0077 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10 TM 9-4910-571-12&P

Equipment Condition

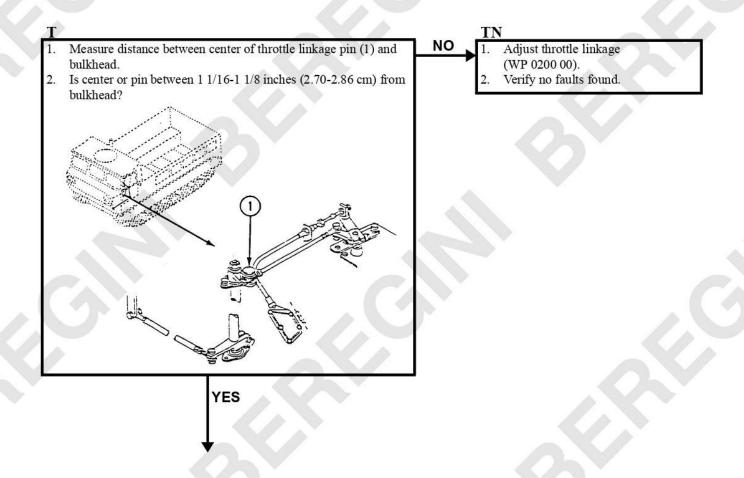
Engine stopped (see your -10)

Carrier blocked (see your -10)

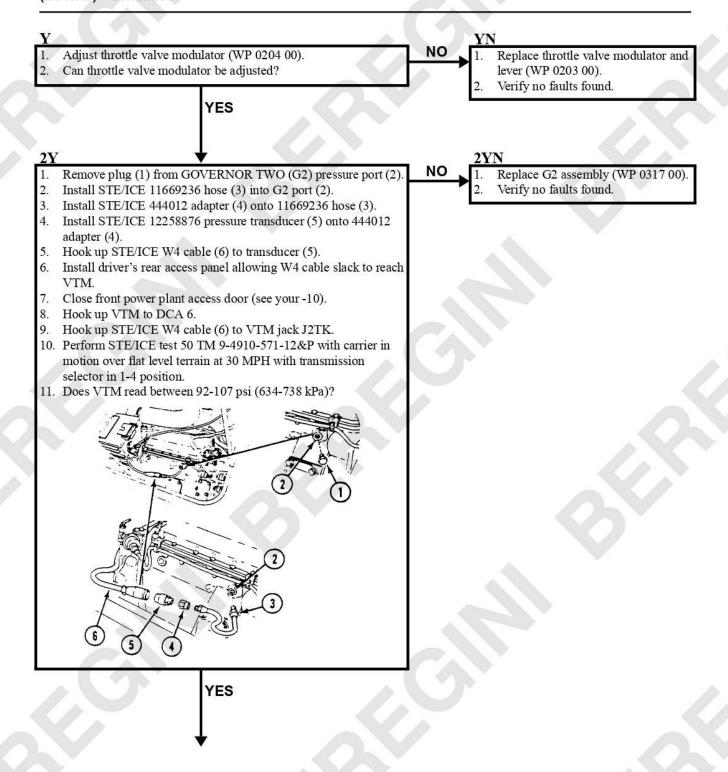
Transmission in SL (see your -10)

Power plant rear access panel removed (see your -10)

Center seat raised (see your -10)



TRANSMISSION WILL NOT UPSHIFT OR SHIFTS ERRATICALLY IN 1-4 POSITION (M548A3)—Continued



TRANSMISSION WILL NOT UPSHIFT OR SHIFTS ERRATICALLY IN 1-4 POSITION (M548A3)—Continued

- G2 pressure is OK.
- Transmission faulty beyond unit repair.
 Notify your supervisor.



TRANSMISSION DOES NOT DOWNSHIFT IN 1-4 POSITION (M548A3)

0078 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

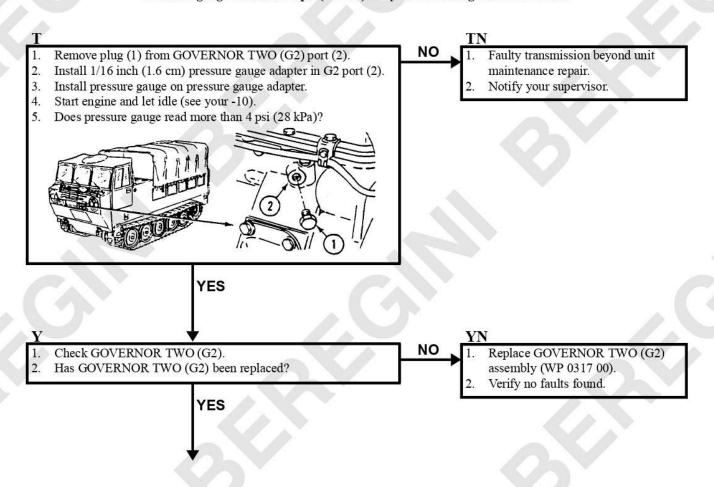
Transmission in SL (see your -10)

Power plant rear access panel removed (see your -10)

Center seat raised (see your -10)

NOTE

Pressure gauge must read 4 psi (28 kPa). Any other reading indicates a fault.



TRANSMISSION DOES NOT DOWNSHIFT IN 1-4 POSITION (M548A3)—Continued

- Faulty transmission beyond unit maintenance repair. Notify your supervisor.

TRANSMISSION DOES NOT HOLD 1ST POSITION (M548A3)

0079 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

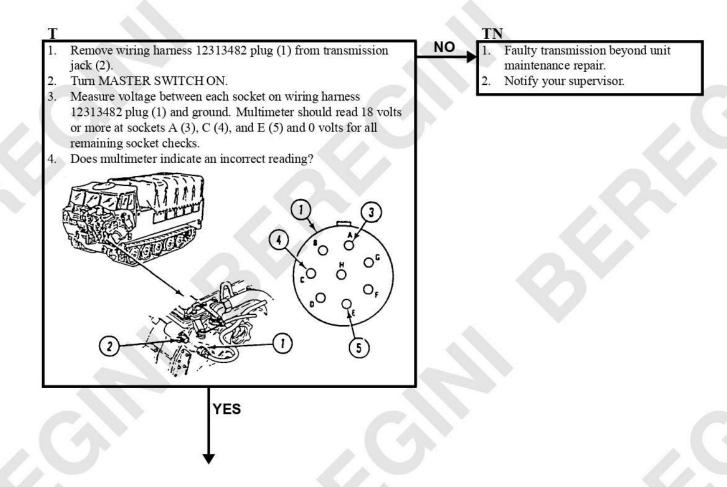
Unit Mechanic

Equipment Condition

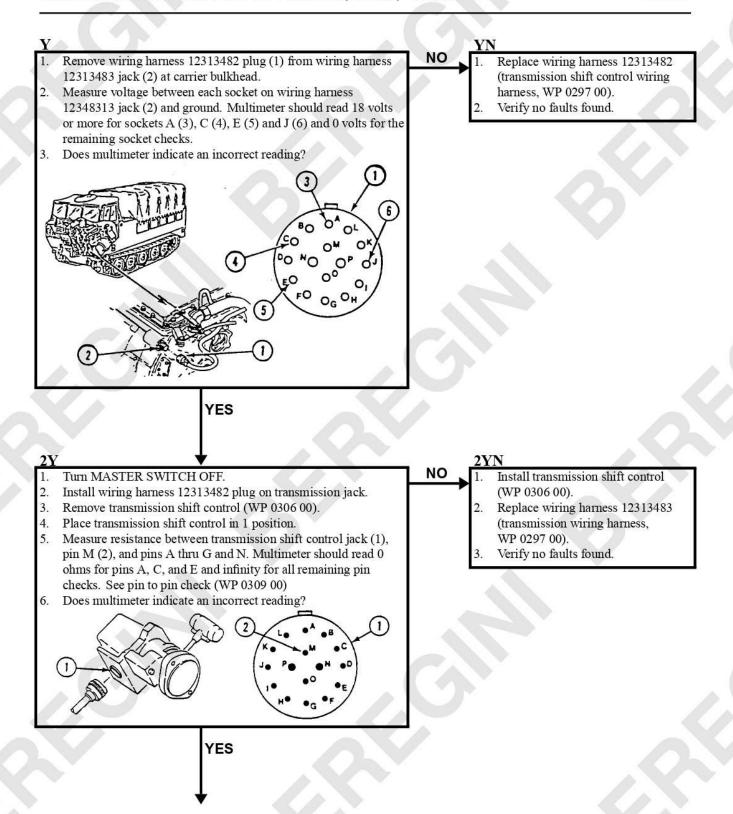
Engine stopped (see your -10) Carrier blocked (see your -10)

Transmission in 1st position (see your -10)

Cab floor plates raised (WP 0395 00)



TRANSMISSION DOES NOT HOLD 1ST POSITION (M548A3)—Continued



TRANSMISSION DOES NOT HOLD 1ST POSITION (M548A3)—Continued

- Install wiring harness 12313482 plug on wiring harness 12349813 jack at carrier bulkhead.
 Replace faulty transmission shift control switch (WP 0309 00).
- Verify no faults found.



TRANSMISSION DOES NOT HOLD 2ND POSITION (M548A3)

008000

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

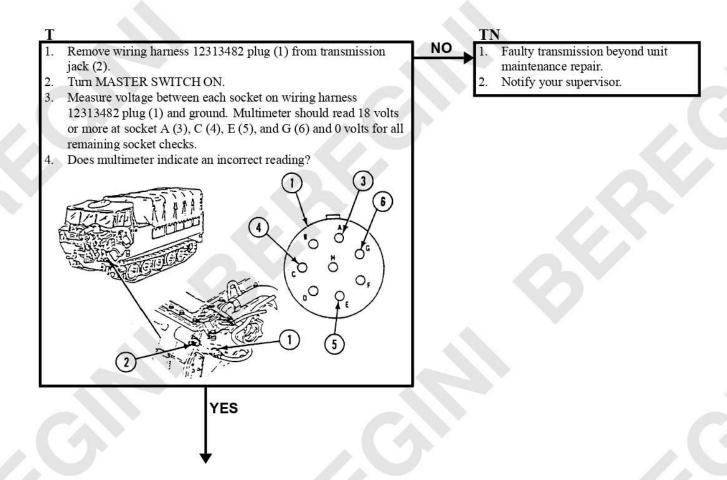
Unit Mechanic

Equipment Condition

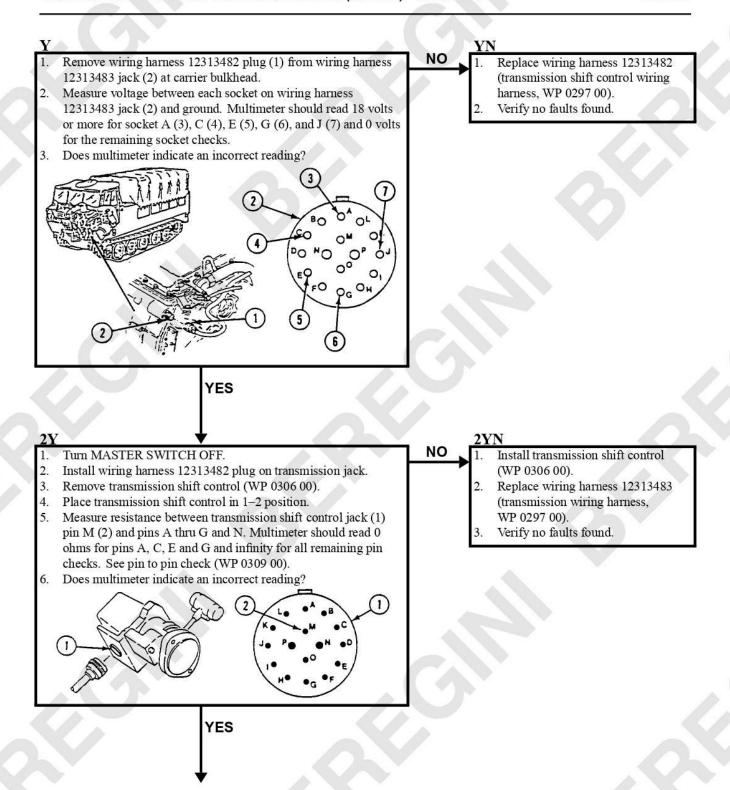
Engine stopped (see your -10) Carrier blocked (see your -10)

Transmission in 1-2 position (see your -10)

Cab floor plates raised (WP 0395 00)



TRANSMISSION DOES NOT HOLD 2ND POSITION (M548A3)—Continued



TRANSMISSION DOES NOT HOLD 2ND POSITION (M548A3)—Continued

- Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
 Replace faulty transmission shift control switch (WP 0309 00).
- Verify no faults found.



TRANSMISSION DOES NOT HOLD 3RD POSITION (M548A3)

008100

INITIAL SETUP:

Maintenance Level

Unit

References See your

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

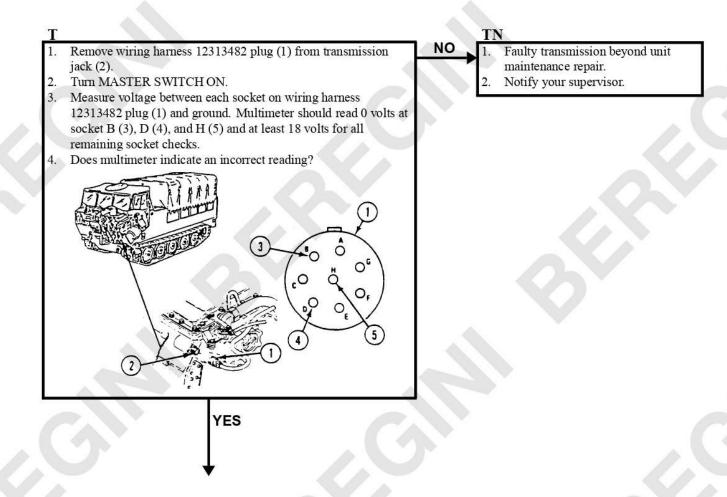
Unit Mechanic

Equipment Condition

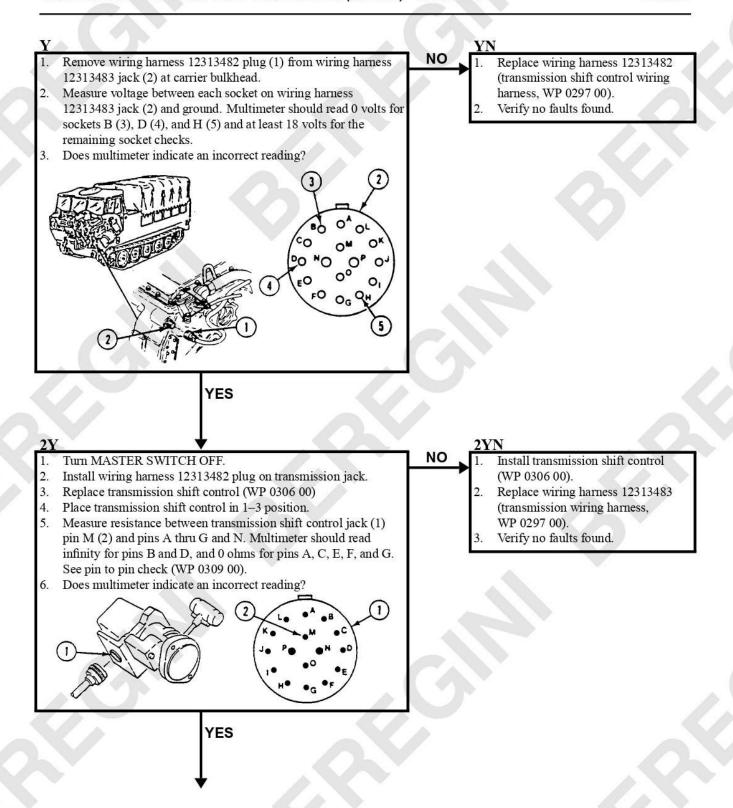
Engine stopped (see your -10) Carrier blocked (see your -10)

Transmission in 1-3 position (see your -10)

Cab floor plates raised (WP 0250 00)



TRANSMISSION DOES NOT HOLD 3RD POSITION (M548A3)—Continued



TRANSMISSION DOES NOT HOLD 3RD POSITION (M548A3)—Continued

- Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
 Replace faulty transmission shift control switch (WP 0309 00).
- Verify no faults found.



TRANSMISSION DOES NOT REVERSE (M548A3)

0082 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

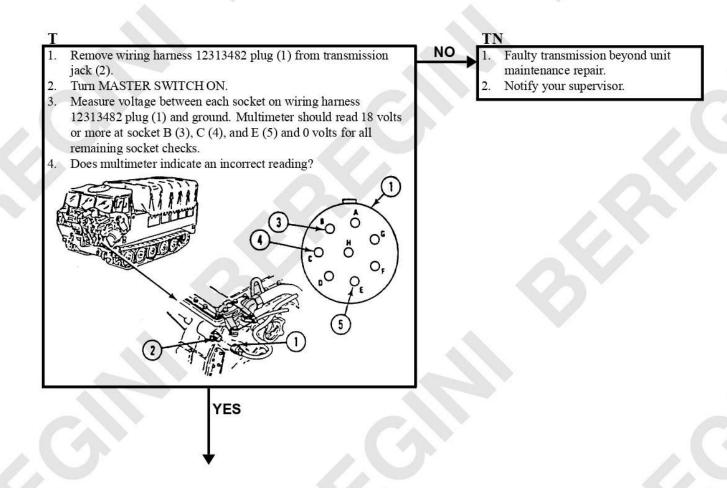
Personnel Required

Unit Mechanic

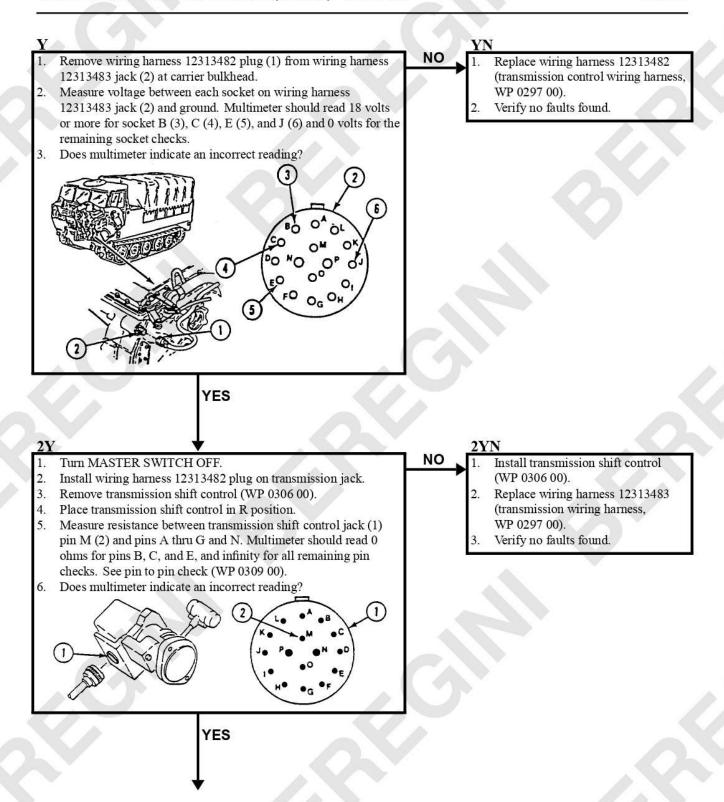
Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10) Transmission in R position (see your -10)

Cab floor plates raised (WP 0250 00)



TRANSMISSION DOES NOT REVERSE (M548A3)—Continued



TRANSMISSION DOES NOT REVERSE (M548A3)—Continued

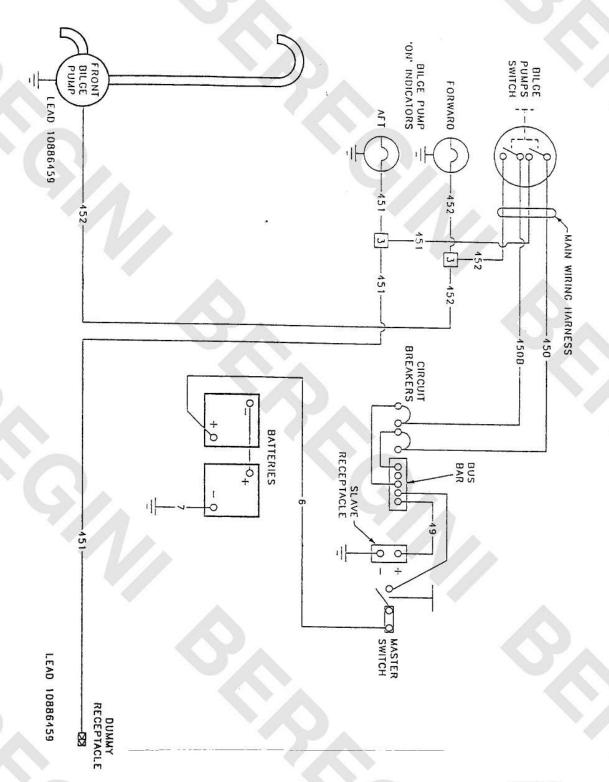
- Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.

 Replace faulty transmission shift control switch (WP 0309 00).
- Verify no faults found.



JAN

M548A1 has two datteries. M548A3 has four datteries. M548A1 bilge pump system schematic is shown.



0083 00-1/2 blank



FRONT BILGE PUMP AND/OR LIGHT DOES NOT OPERATE

0084 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

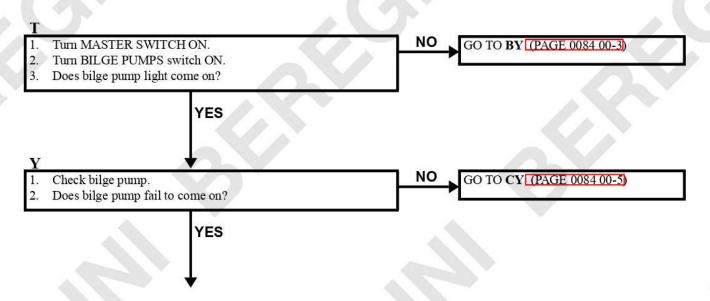
See your -10

Equipment Condition

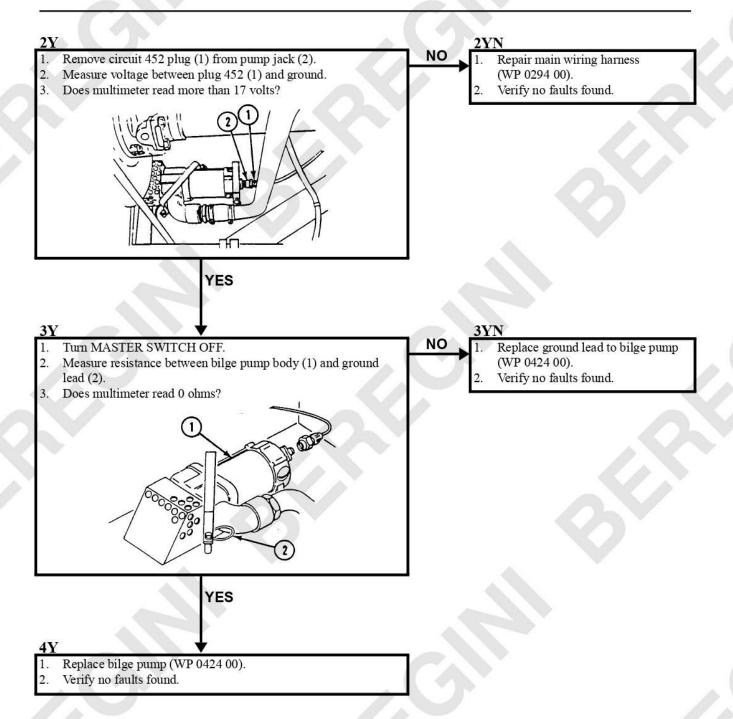
Engine stopped (see your -10)
Carrier blocked (see your -10)
MASTER SWITCH OFF (see your -10)
Driver's seat raised (see your -10)
Center floor plates raised (WP 0394 00 or WP 0395 00)

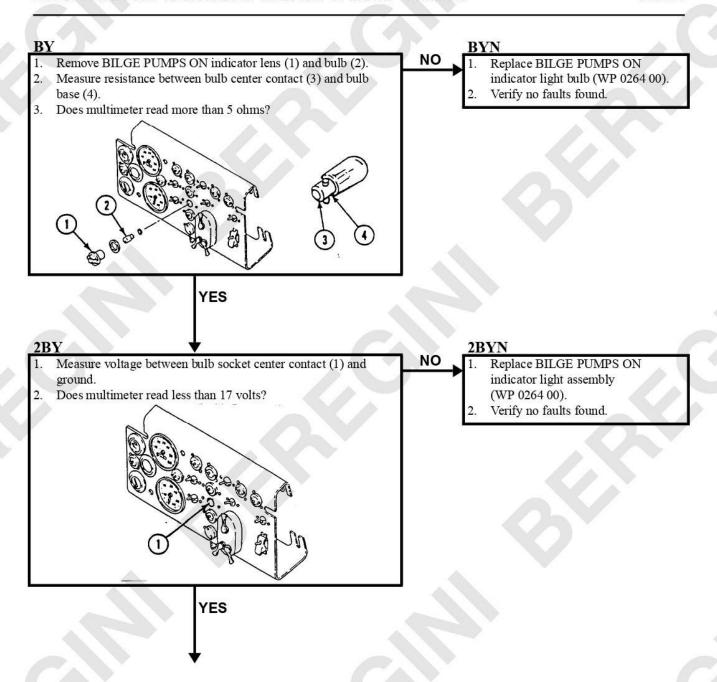
NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

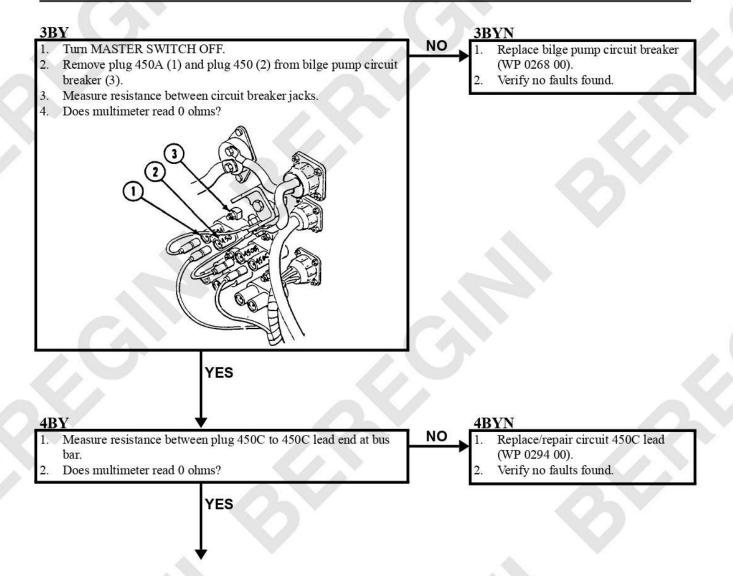


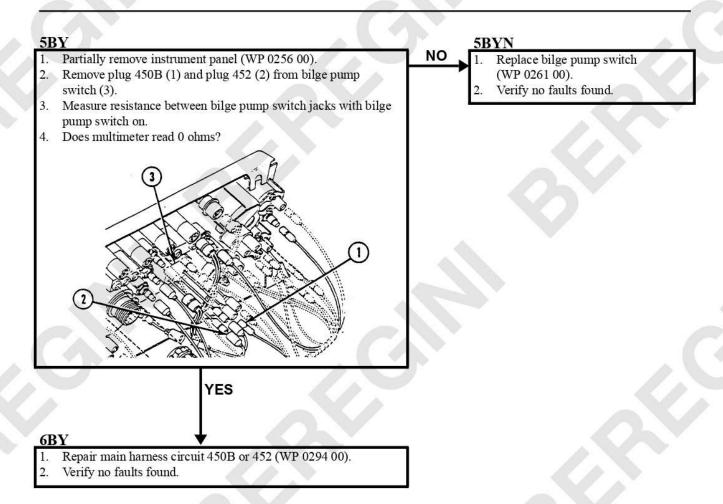
FRONT BILGE PUMP AND/OR LIGHT DOES NOT OPERATE—Continued

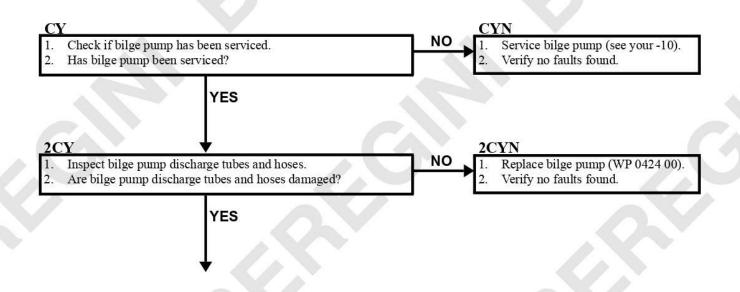




FRONT BILGE PUMP AND/OR LIGHT DOES NOT OPERATE—Continued







FRONT BILGE PUMP AND/OR LIGHT DOES NOT OPERATE—Continued

0084 00

3CY

- Replace bilge pump discharge tubes and hoses (WP 0425 00). Verify no faults found.

VEHICLE COMPARTMENT HEATER MALFUNCTIONS

0085 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

Unit Mechanic

References

See your -10

TM 9-2540-205-24&P

Equipment Condition

Engine stopped (see your -10)

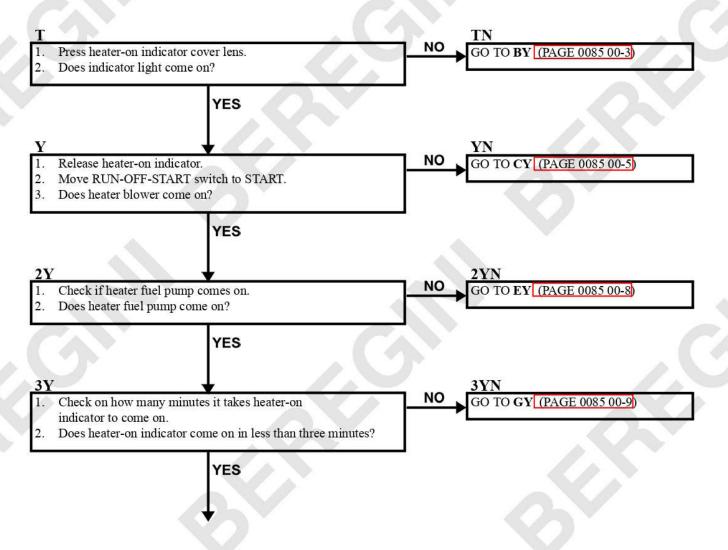
Carrier blocked (see your -10)

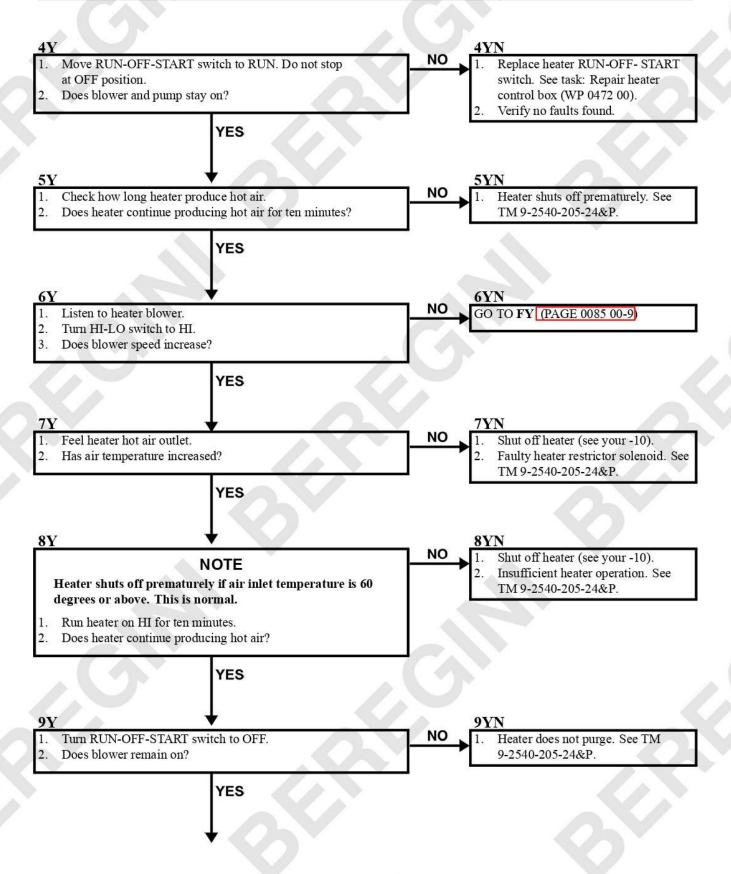
Heater HI-LO switch in LO

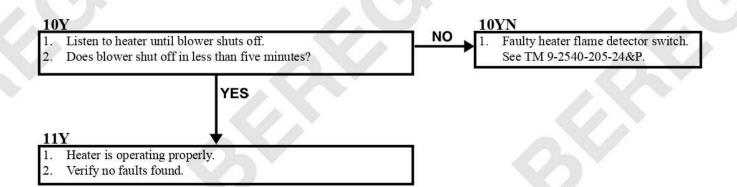
NOTE

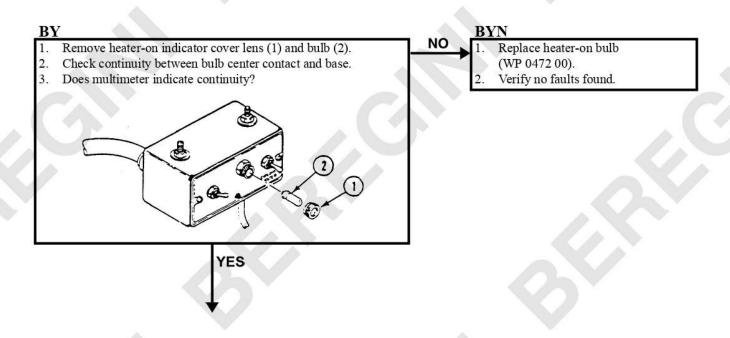
M548A1 and M548A3 troubleshooting procedures are the same even though component locations are different. When needed, locators are used to show the different component locations.

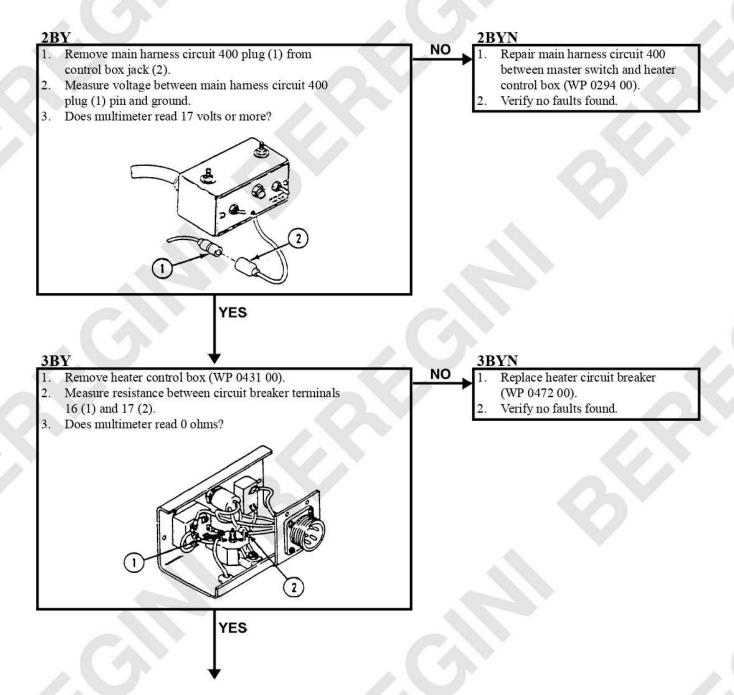
The compartment heater has a fuel filter in between the fuel pump and the heater.

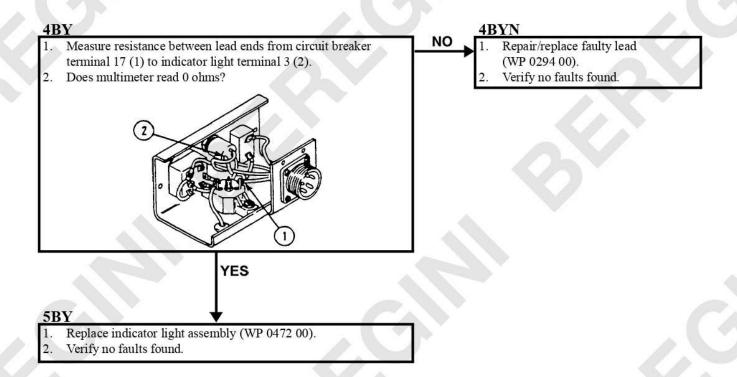


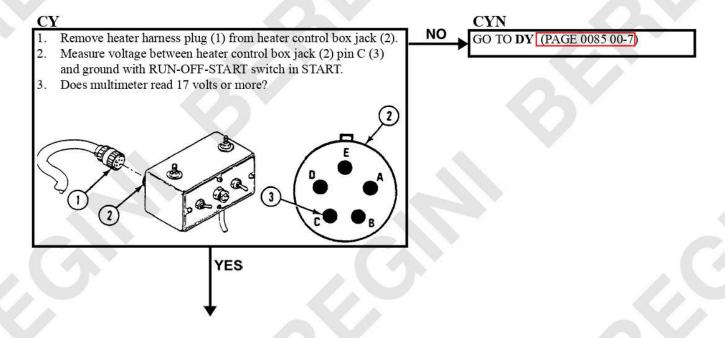


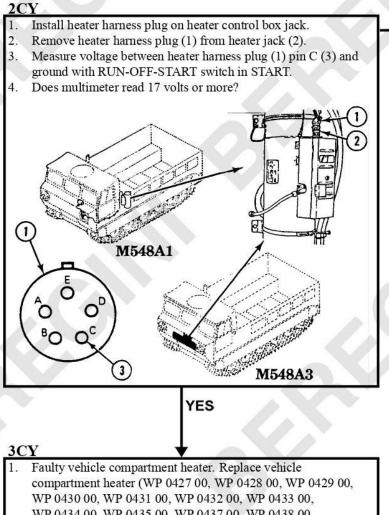










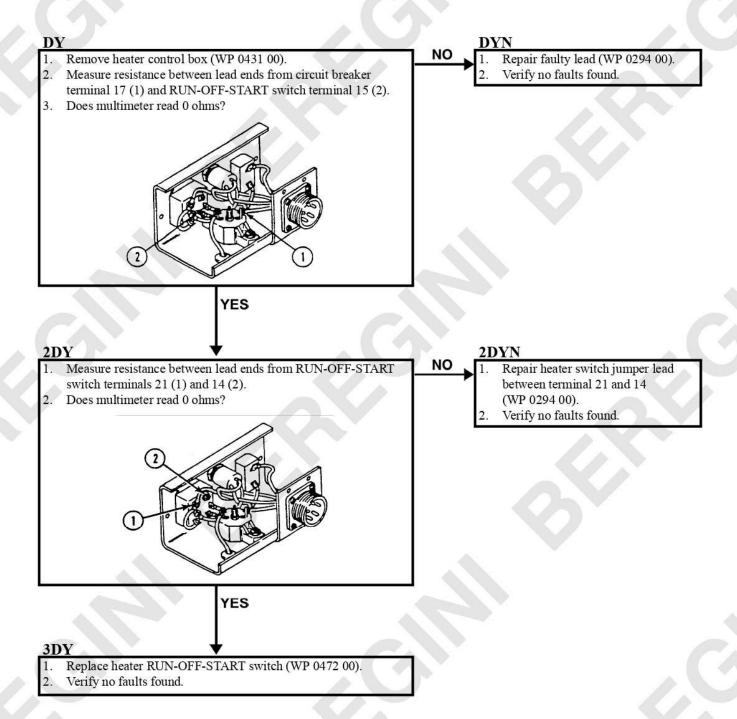


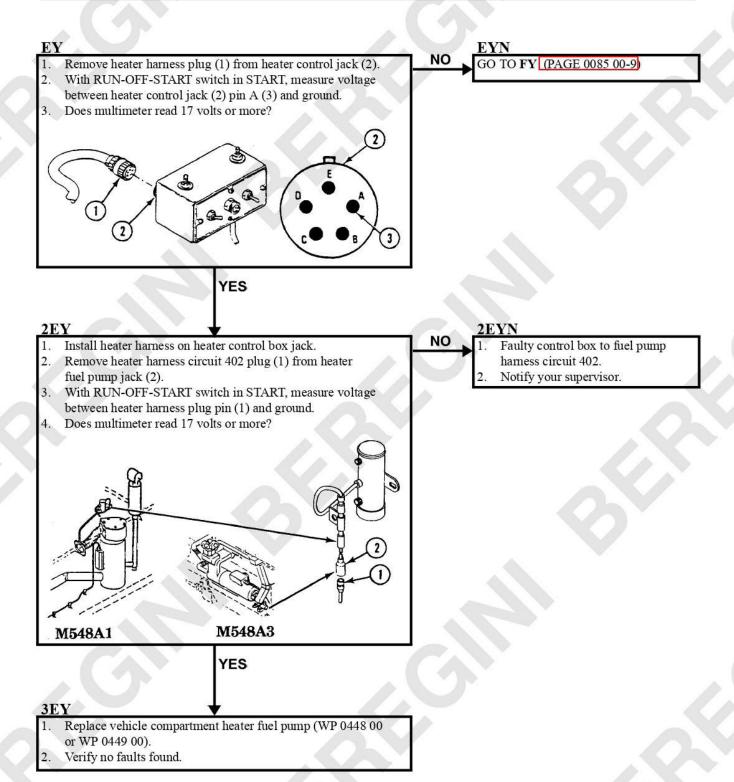
2CYN

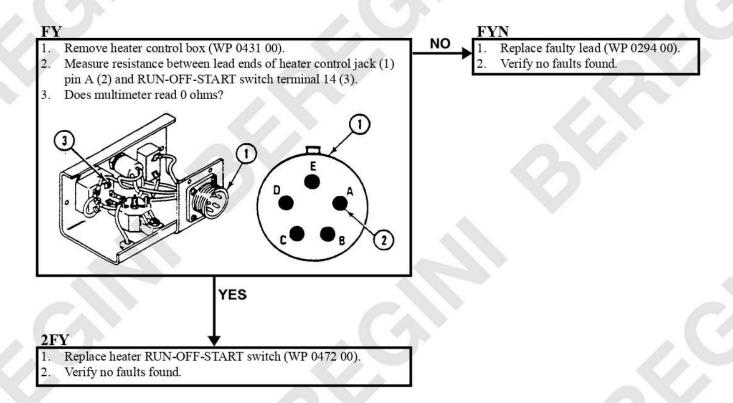
NO

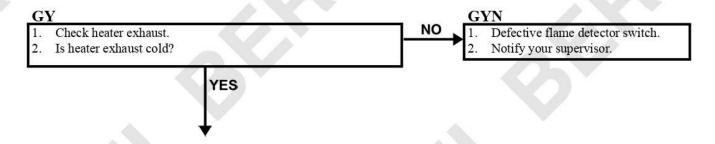
- Faulty heater wiring harness.
 - Notify your supervisor.

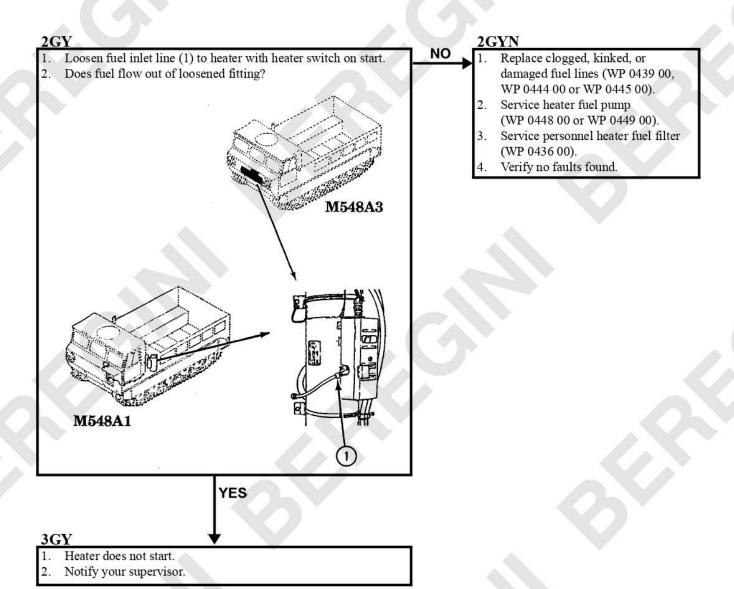
- WP 0434 00, WP 0435 00, WP 0437 00, WP 0438 00, WP 0439 00, WP 0446 00 or WP 0447 00).
- Verify no faults found.

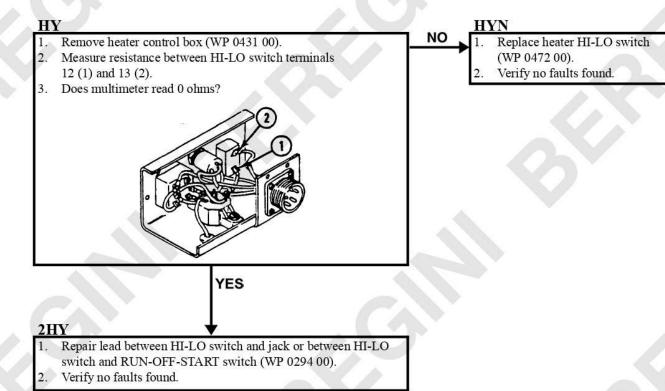














COOLANT HEATER MALFUNCTIONS

008600

INITIAL SETUP:

Maintenance Level

Unit

See your -10

References

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29) Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

Unit Mechanic

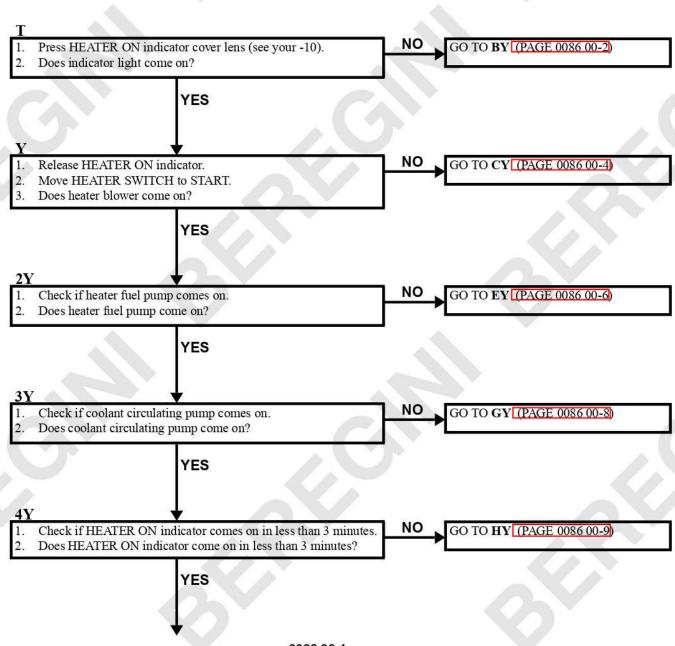
Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

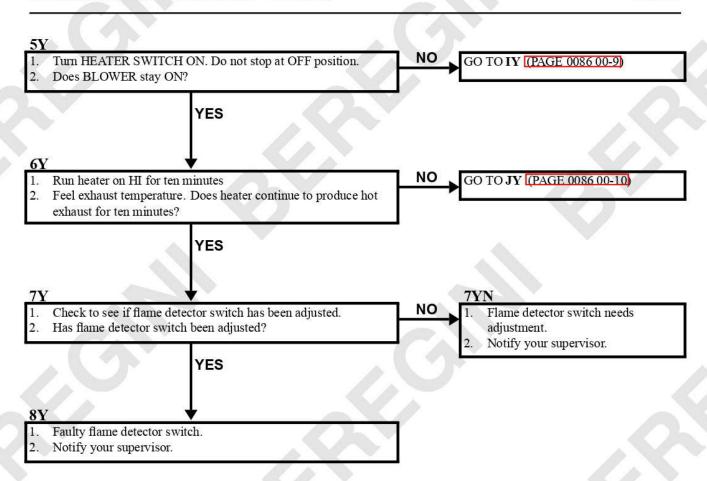
Heater on HI (see your -10)

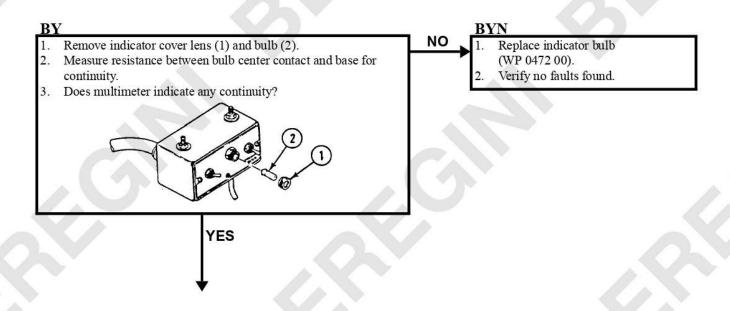
Engine cold

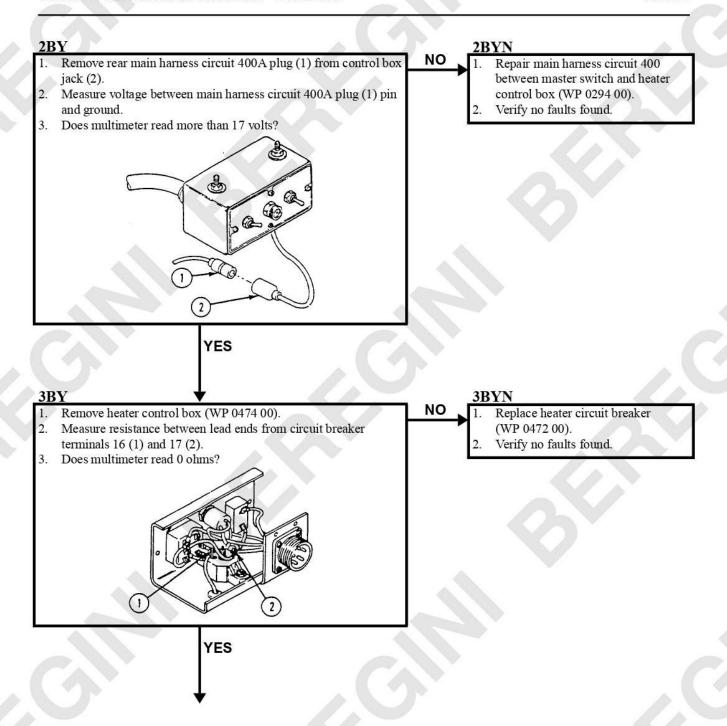


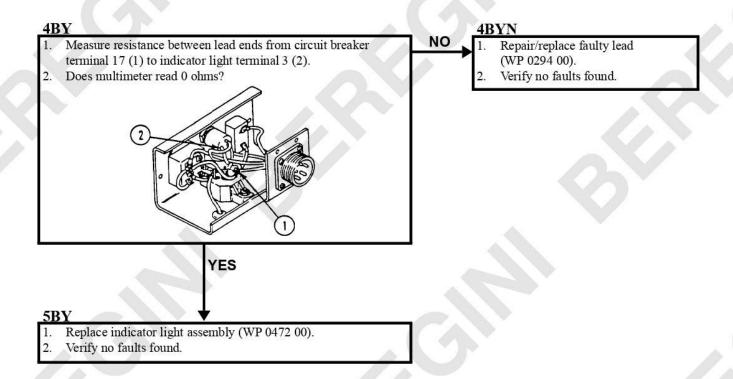
Presentation Copyright © 1995 – 2010 All Rights Reserved Infinite Technologies Inc.

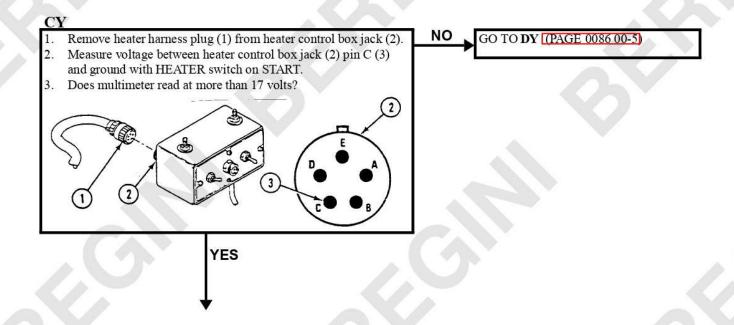
COOLANT HEATER MALFUNCTIONS—Continued

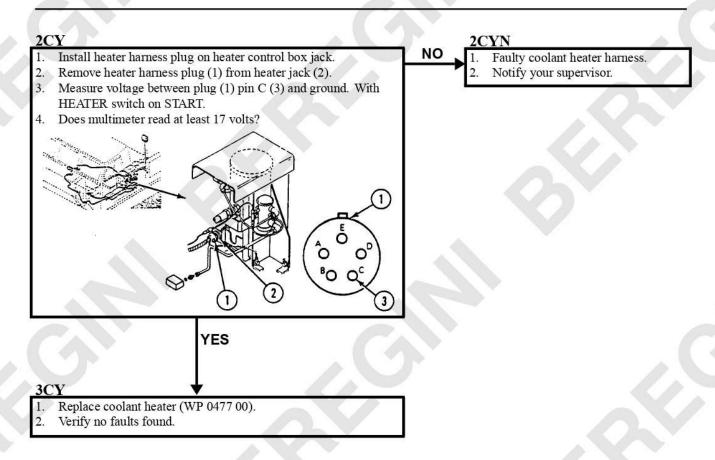


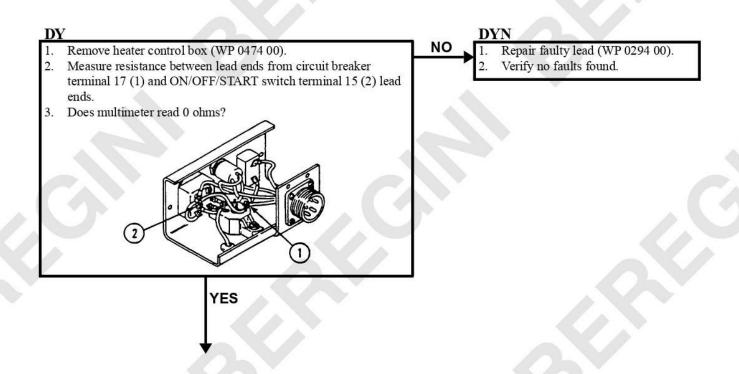


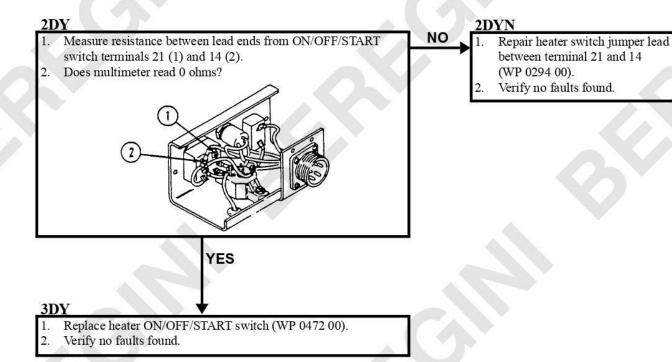


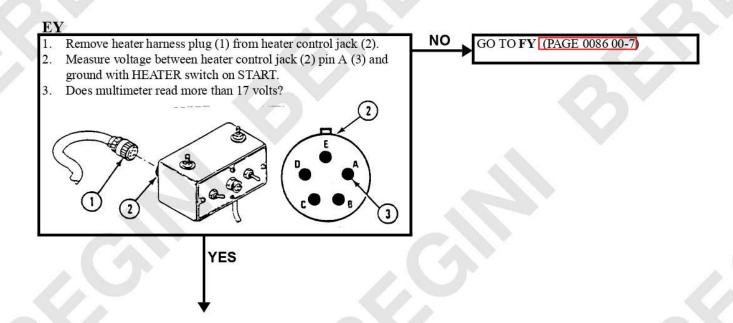


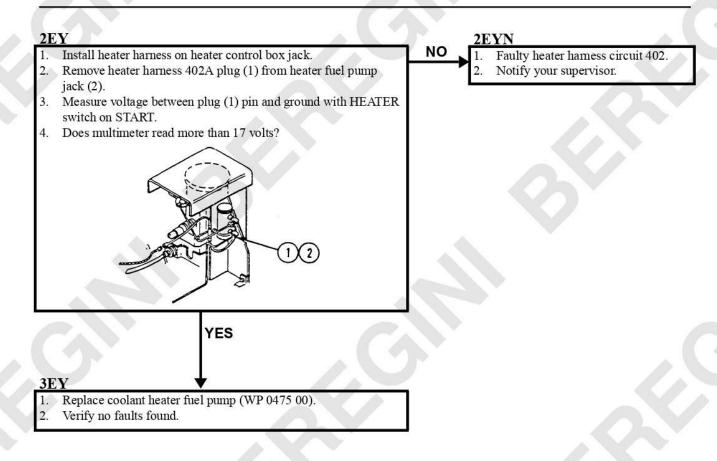


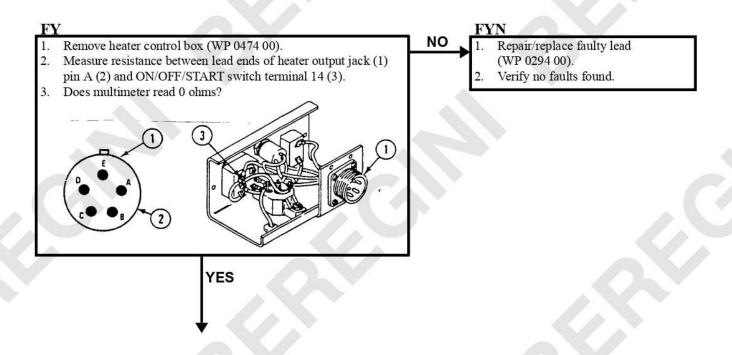










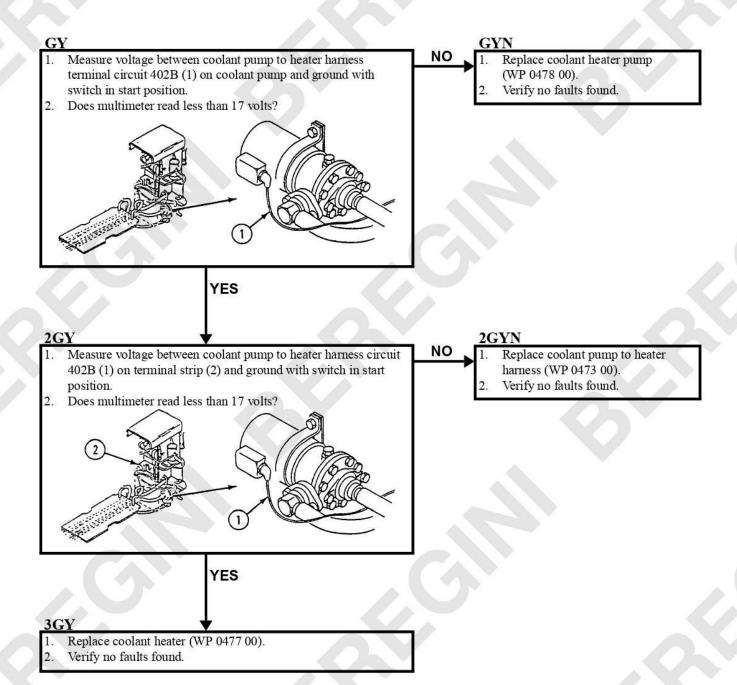


COOLANT HEATER MALFUNCTIONS—Continued

008600

2FY

- 1. Replace heater ON/OFF/START switch (WP 0472 00).
- 2. Verify no faults found.



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COOLANT HEATER MALFUNCTIONS—Continued

008600

3IY

- 1. Faulty flame detector switch.
- Notify your supervisor.

1. Check fuel supply lines for clogged or unserviceable hoses or fittings. 2. Are fuel supply hoses and lines unclogged and serviceable? 1. Clear obstruction or replace fuel hoses/tubing as required (WP 0475 00). 2. Verify no faults found. 2. Verify no faults found.

SPEEDOMETER MALFUNCTIONS

008700

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Grease WP 0542 00, Item 14

Personnel Required

Unit Mechanic

References

See your -10 See your PMCS

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

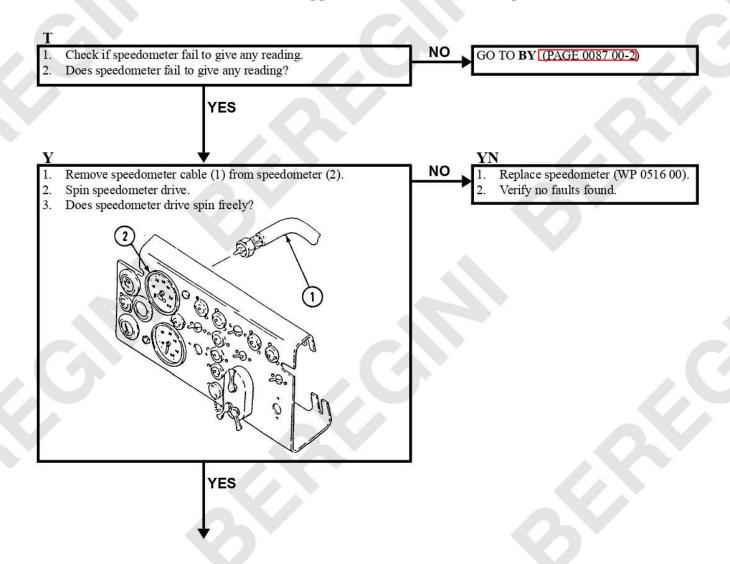
Instrument panel partially removed (WP 0256 00)

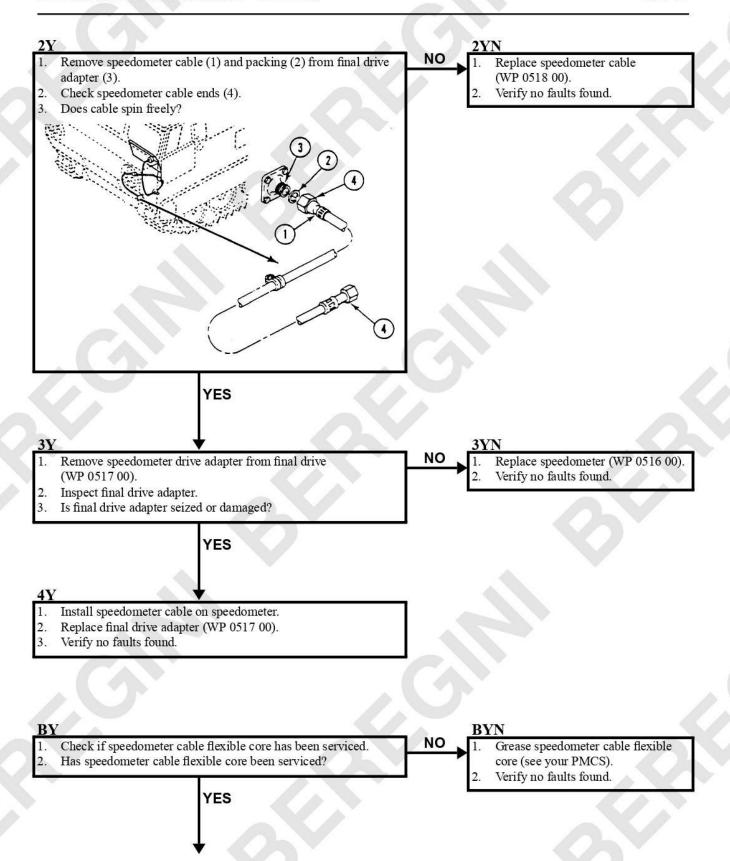
Left cab floor plate removed (WP 0394 00 or

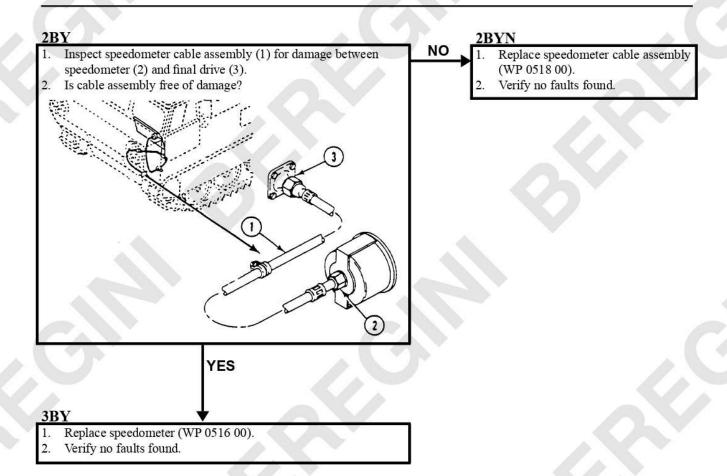
WP 0395 00)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.









TACHOMETER MALFUNCTIONS

008800

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Grease WP 0542 00, Item 14

Personnel Required

Unit Mechanic

Helper (H)

References

See your -10 See your PMCS

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

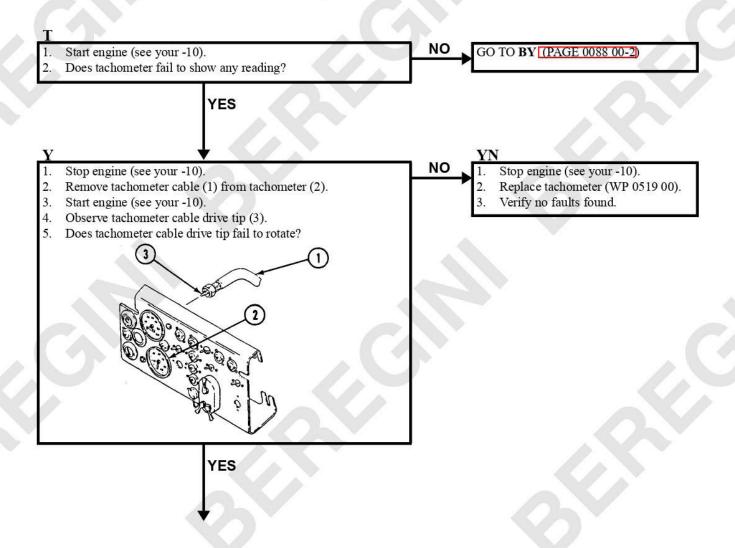
Power plant rear access door/panel removed

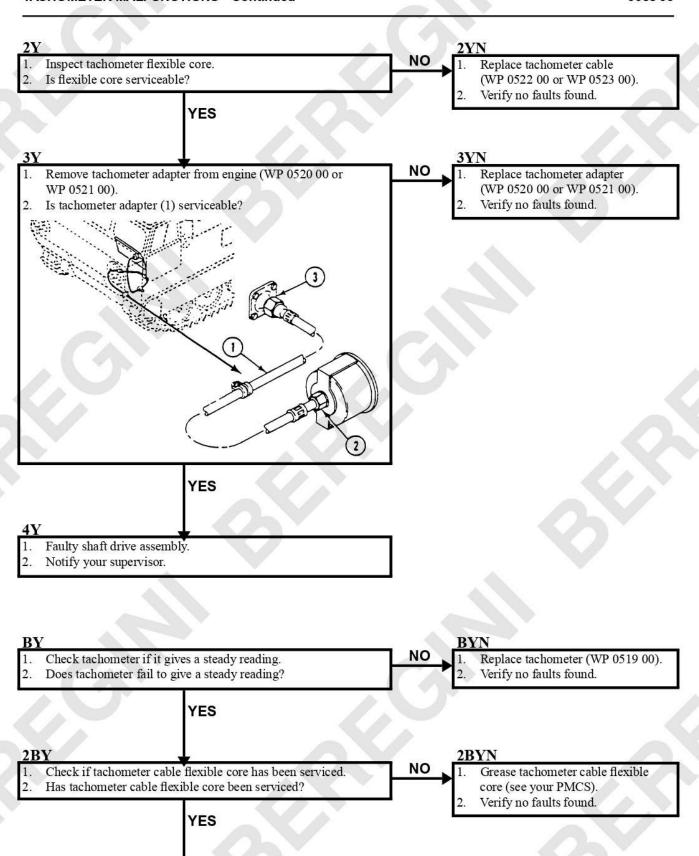
(see your -10)

Instrument panel partially removed (WP 0256 00)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.





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TACHOMETER MALFUNCTIONS—Continued

008800

3BY

- 1. Replace tachometer cable (WP 0522 00 or WP 0523 00).
- Verify no faults found.



WINCH CASE OVERHEATS (M548A1)

008900

INITIAL SETUP:

 Maintenance Level
 References

 Unit
 See your -10

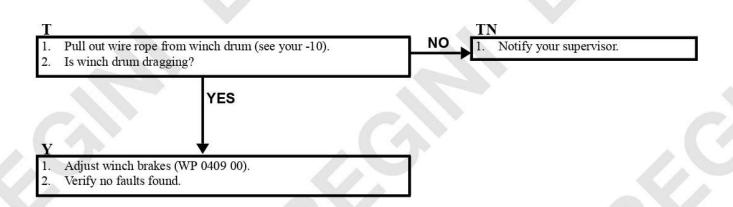
Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required
Unit Mechanic

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)





WINCH DRUM DOES NOT TURN WITH DRUM CLUTCH IN "CLUTCH IN" POSITION (M548A1)

0090 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

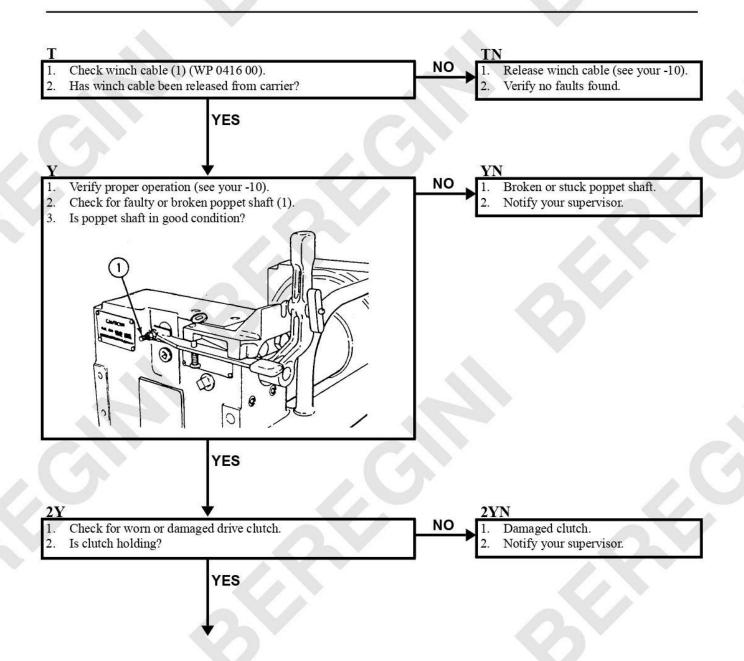
See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Winch cable reeled out (see your -10)



WINCH DRUM DOES NOT TURN WITH DRUM CLUTCH IN "CLUTCH IN" POSITION 0090 00 (M548A1)—Continued 3Y 1. Check for badly worn or broken gears. 2. Are gears in good condition? YES 4Y 1. Check drag brake adjustment (WP 0408 00). 2. Has drag brake been adjusted? YES YES YES

Replace sheared winch yoke shear pin (WP 0412 00).

Verify no faults found.

WINCH DRUM DOES NOT TURN DRUM CLUTCH IN "CLUTCH OUT" POSITION (M548A1)

0091 00

INITIAL SETUP:

Maintenance Level References

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

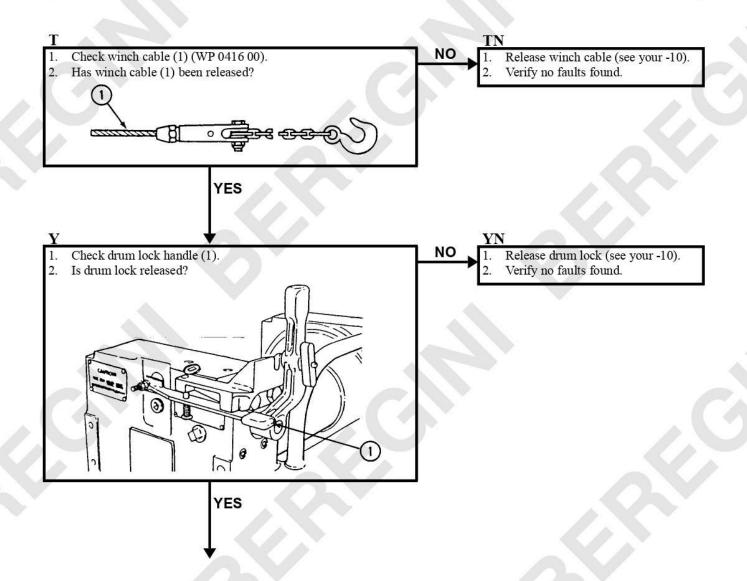
Personnel Required

Unit Mechanic

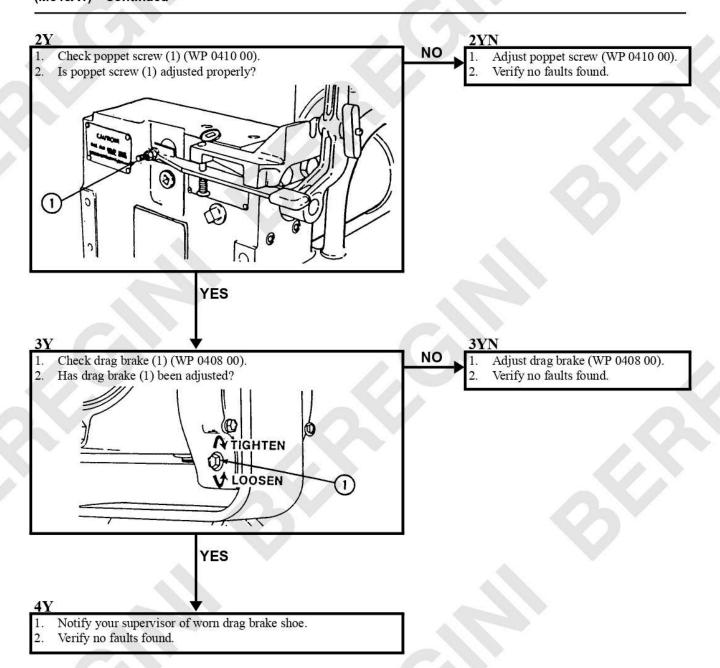
Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)



WINCH DRUM DOES NOT TURN DRUM CLUTCH IN "CLUTCH OUT" POSITION (M548A1)—Continued



WINCH BRAKE DOES NOT HOLD (M548A1)

0092 00

INITIAL SETUP:

Maintenance Level

Unit

References
See your -10

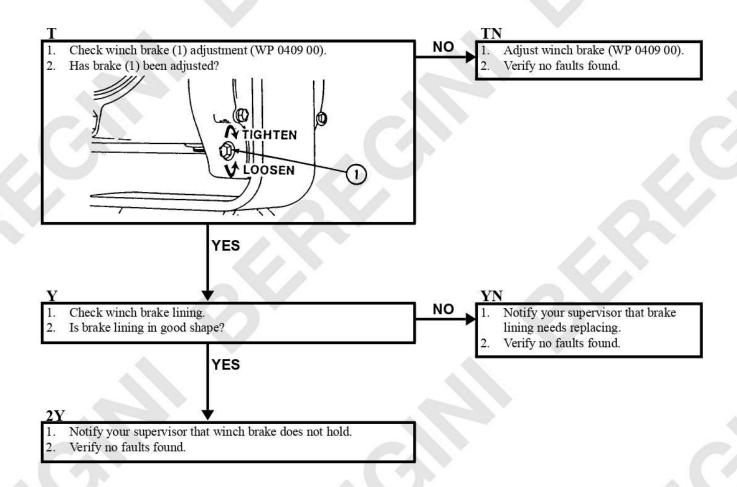
Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Equipment Condition

Personnel Required
Unit Mechanic

Engine stopped (see your -10) Carrier blocked (see your -10)





POWER TAKEOFF DOES NOT ENGAGE WHEN WINCH CONTROL IS ACTUATED (M548A1)

0093 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

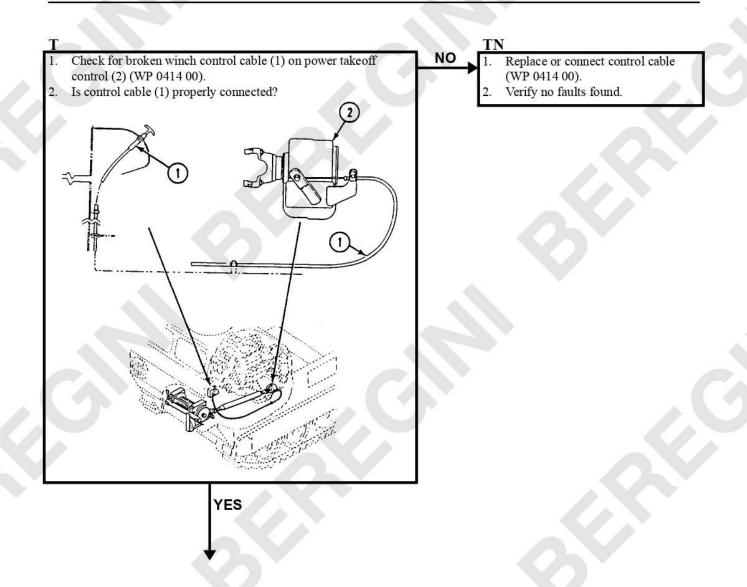
Engine stopped (see your -10)

Carrier blocked (see your -10)

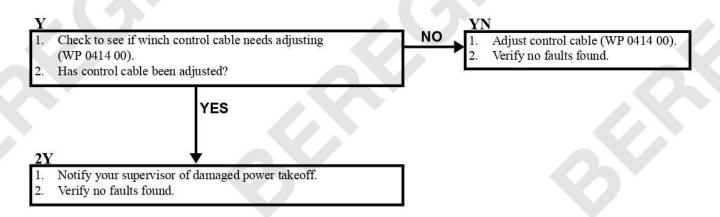
Power plant upper rear access door removed (see your -10)

Center seat raised (see your -10)

Center floor plates removed (WP 0394 00)



POWER TAKEOFF DOES NOT ENGAGE WHEN WINCH CONTROL IS ACTUATED (M548A1)—Continued



EXCESSIVE OIL LEAKS (WINCH TRANSFER GEARCASE AND POWER TAKEOFF) (M548A1)

0094 00

INITIAL SETUP:

Maintenance Level
Unit
References
See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

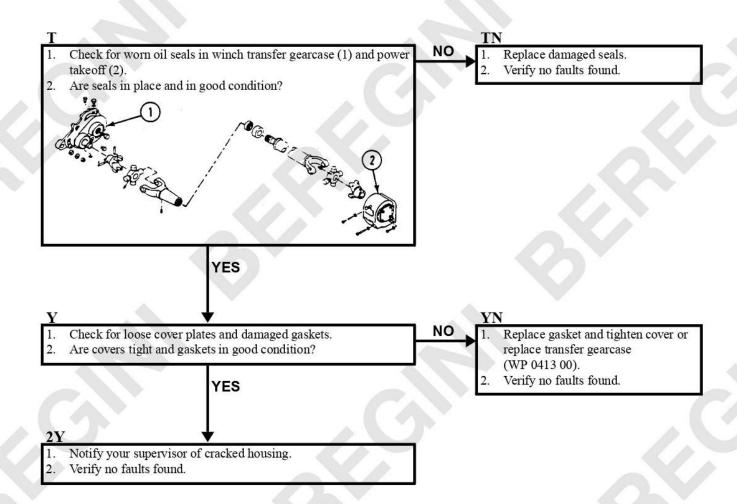
Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)





WINCH PROPELLER SHAFT NOISY DURING OPERATION (M548A1)

0095 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

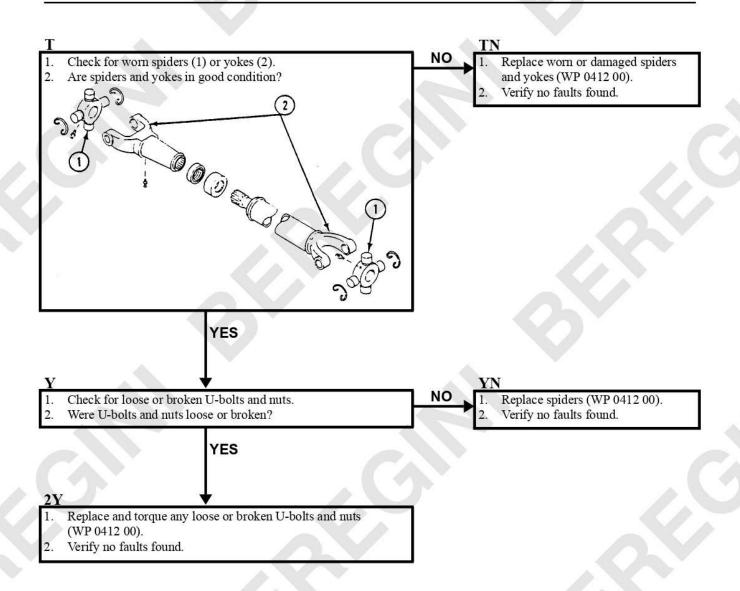
Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)





COMPRESSOR AIR OUTPUT ADEQUATE, BUT NO AIR PRESSURE INDICATION ON PANEL AIR BRAKE PRESSURE INDICATOR (M548A1)

0096 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

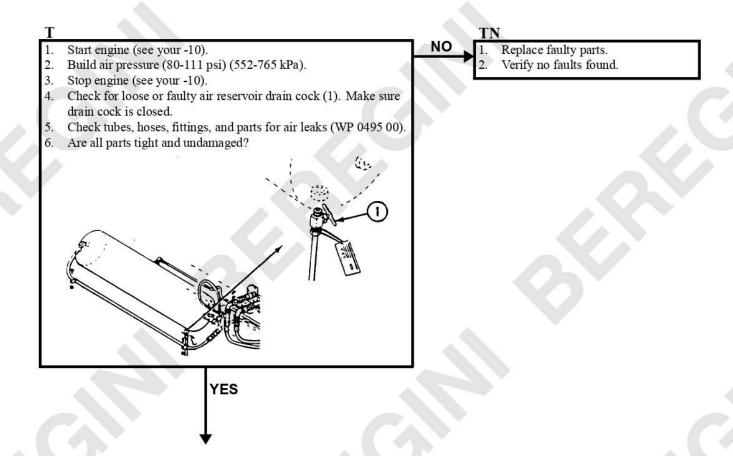
See your -10

Equipment Condition

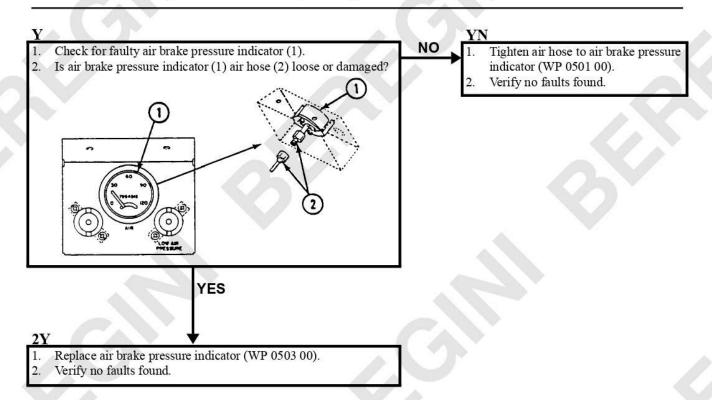
Engine stopped (see your -10)

Carrier blocked (see your -10)

Power plant rear access door removed (see your -10)



COMPRESSOR AIR OUTPUT ADEQUATE, BUT NO AIR PRESSURE INDICATION ON PANEL AIR BRAKE PRESSURE INDICATOR (M548A1)—Continued



LOW AIR PRESSURE WARNING LIGHT DOES NOT LIGHT WHEN AIR PRESSURE FALLS BELOW 60 PSI (414 KPA) (M548A1)

0097 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

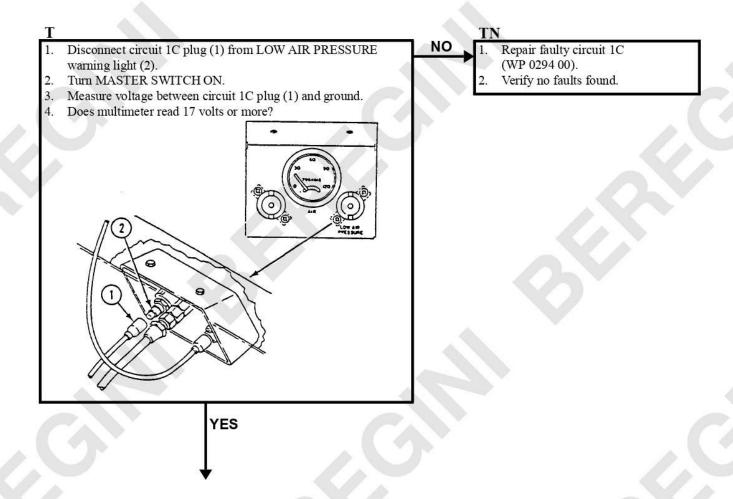
Personnel Required

Unit Mechanic

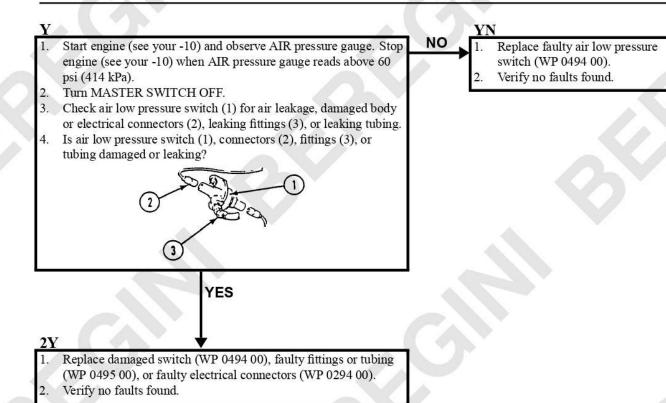
Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)



LOW AIR PRESSURE WARNING LIGHT DOES NOT LIGHT WHEN AIR PRESSURE FALLS BELOW 60 PSI (414 KPA) (M548A1)—Continued



COMPRESSOR DOES NOT MAINTAIN AIR PRESSURE (M548A1)

0098 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

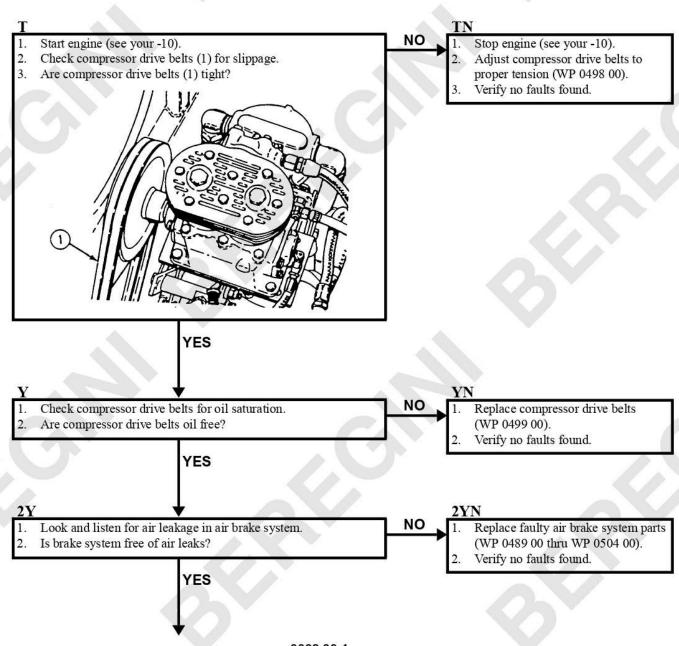
Equipment Condition

Engine stopped (see your -10)

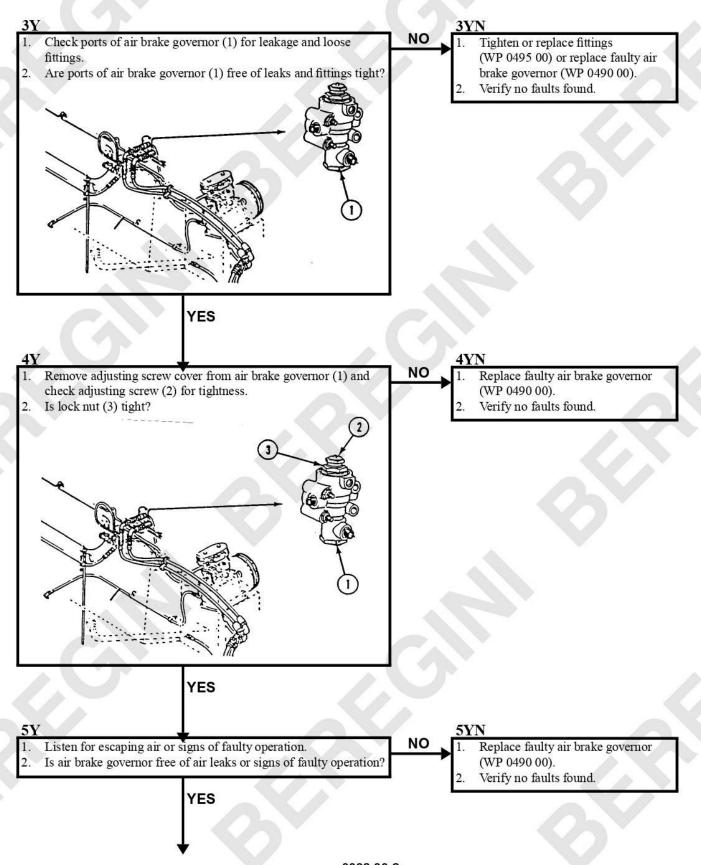
Carrier blocked (see your -10)

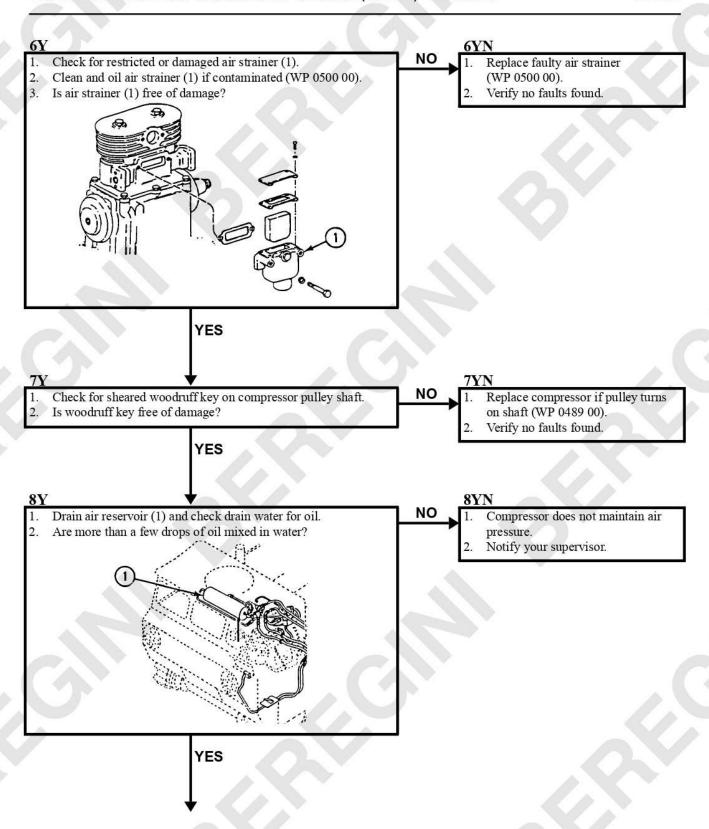
Power plant rear access cover/door removed

(see your -10)



COMPRESSOR DOES NOT MAINTAIN AIR PRESSURE (M548A1)—Continued





COMPRESSOR DOES NOT MAINTAIN AIR PRESSURE (M548A1)—Continued

- Replace worn compressor (WP 0489 00). Verify no faults found.

TOWED LOAD BRAKES DO NOT OPERATE WHEN PEDAL IS PRESSED; AIR PRESSURE ADEQUATE (M548A1)

0099 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

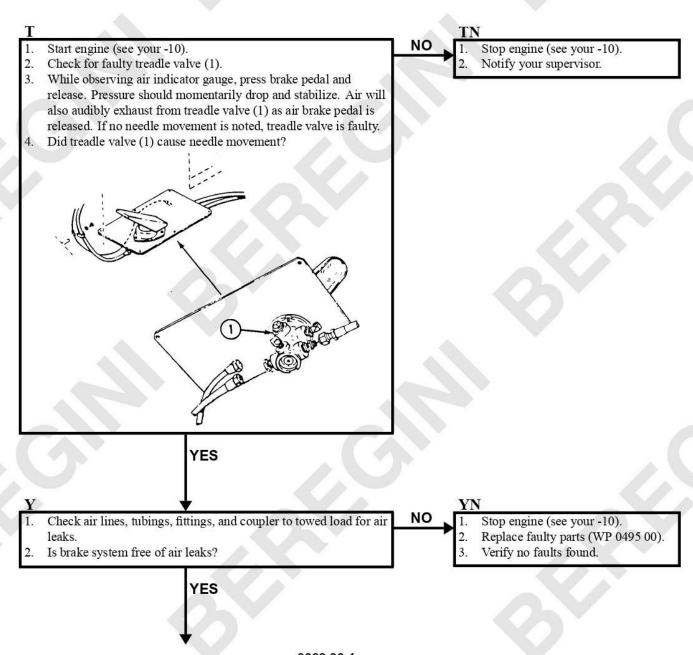
Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)



TOWED LOAD BRAKES DO NOT OPERATE WHEN PEDAL IS PRESSED; AIR PRESSURE ADEQUATE (M548A1)—Continued

- Stop engine (see your -10). Notify your supervisor.

TOO MUCH OIL DRAINAGE FROM RESERVOIR DRAIN COCK (M548A1)

0100 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

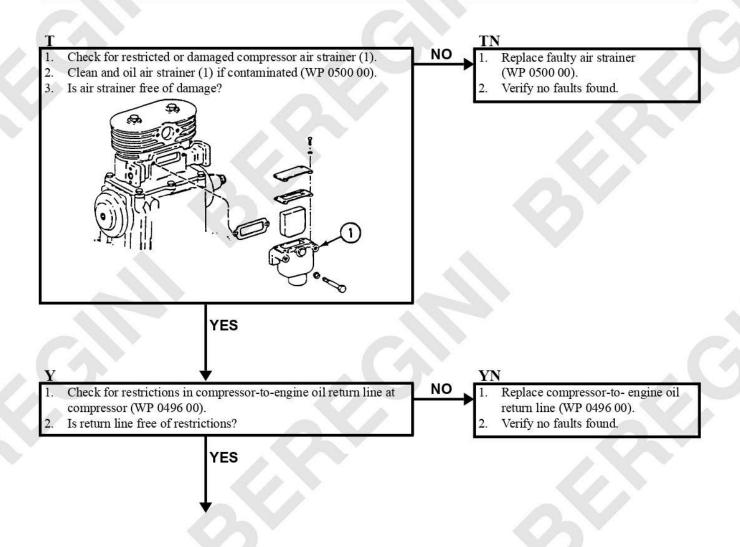
Equipment Condition

Engine stopped (see your -10)

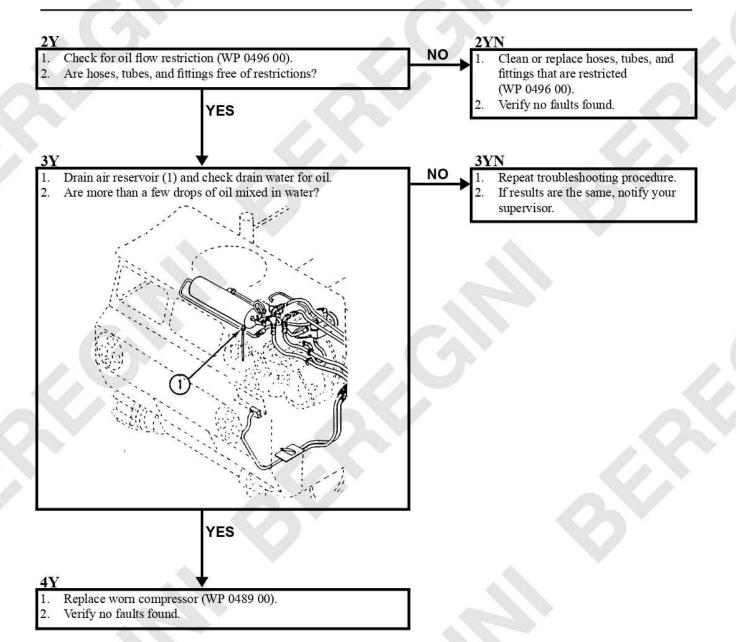
Carrier blocked (see your -10)

Power plant rear access door removed (see your -10)

Center seat raised (see your -10)



TOO MUCH OIL DRAINAGE FROM RESERVOIR DRAIN COCK (M548A1)—Continued



TOO MUCH FOREIGN MATTER IN RESERVOIR (M548A1)

0101 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

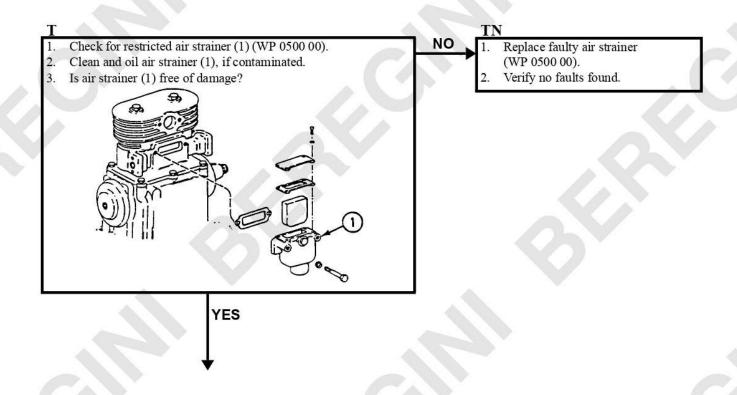
Equipment Condition

Engine stopped (see your -10)

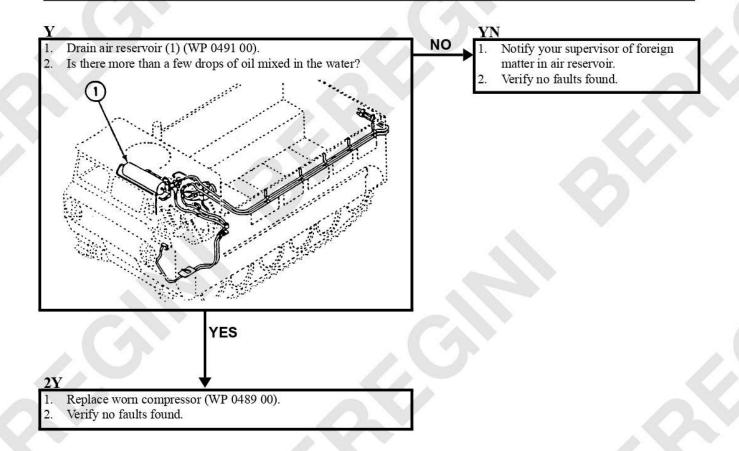
Carrier blocked (see your -10)

Power plant rear access door removed (see your -10)

Center seat raised (see your -10)



TOO MUCH FOREIGN MATTER IN RESERVOIR (M548A1)—Continued



COMPRESSOR OPERATION TOO NOISY (M548A1)

0102 00

INITIAL SETUP:

Maintenance Level

Unit

References
See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

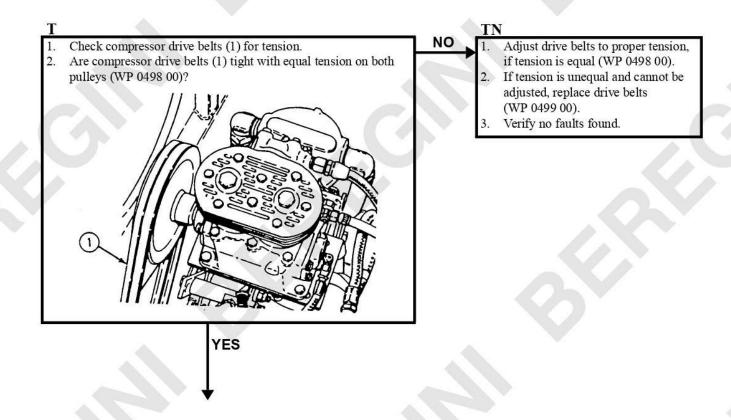
Unit Mechanic

Equipment Condition

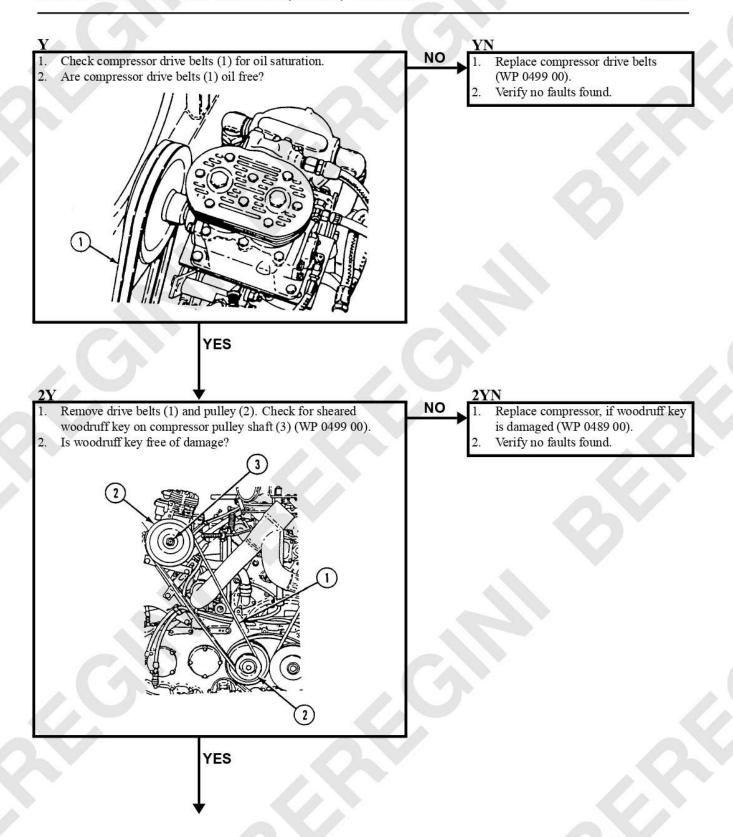
Engine stopped (see your -10)

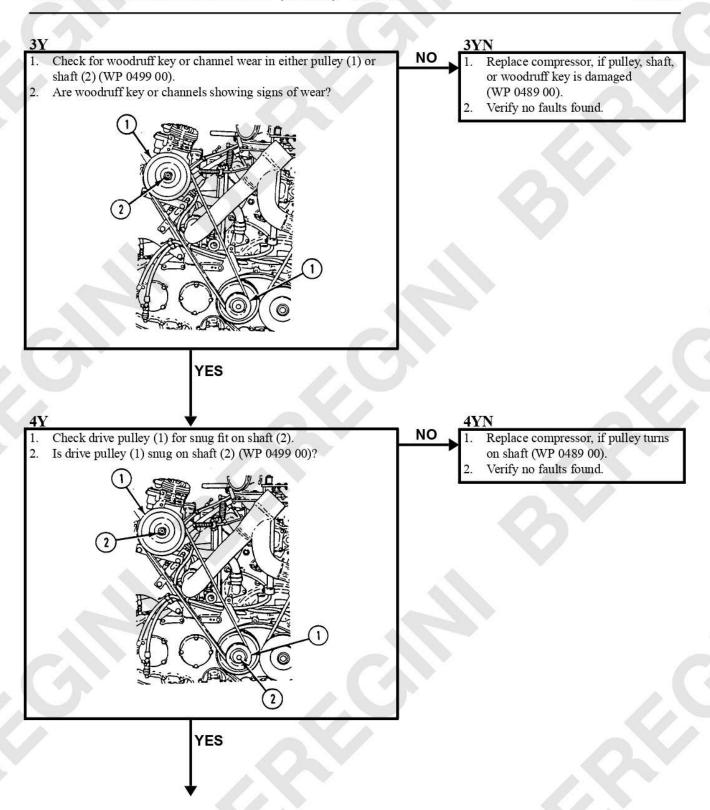
Carrier blocked (see your -10)

Power plant rear access door removed (see your -10)

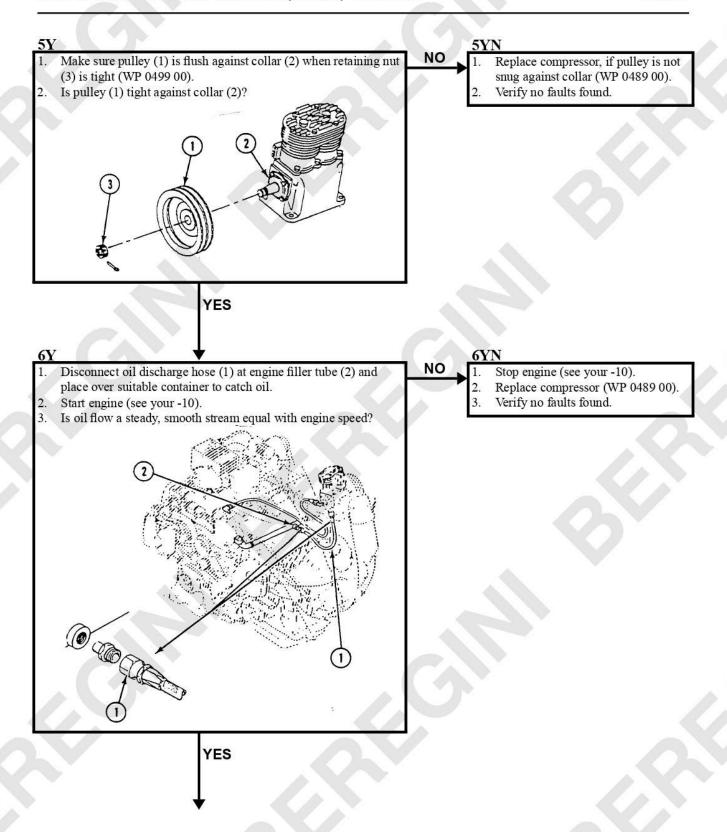


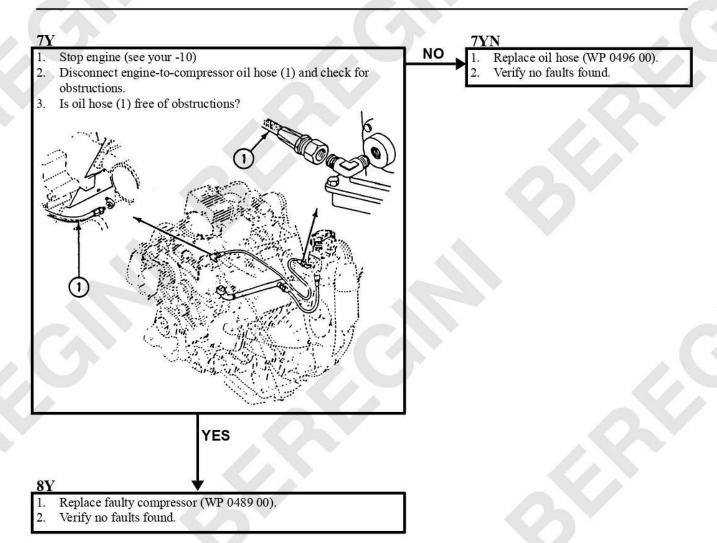
COMPRESSOR OPERATION TOO NOISY (M548A1)—Continued





COMPRESSOR OPERATION TOO NOISY (M548A1)—Continued







PARTICULATE PRECLEANER MOTOR DOES NOT WORK (M548A3)

0103 00

INITIAL SETUP:

Maintenance Level

Unit

See your -10

References

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

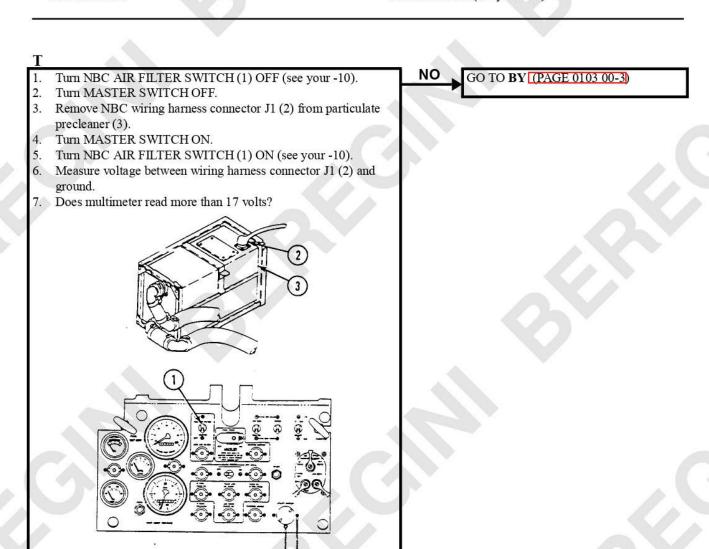
Personnel Required

Unit Mechanic

Equipment Condition

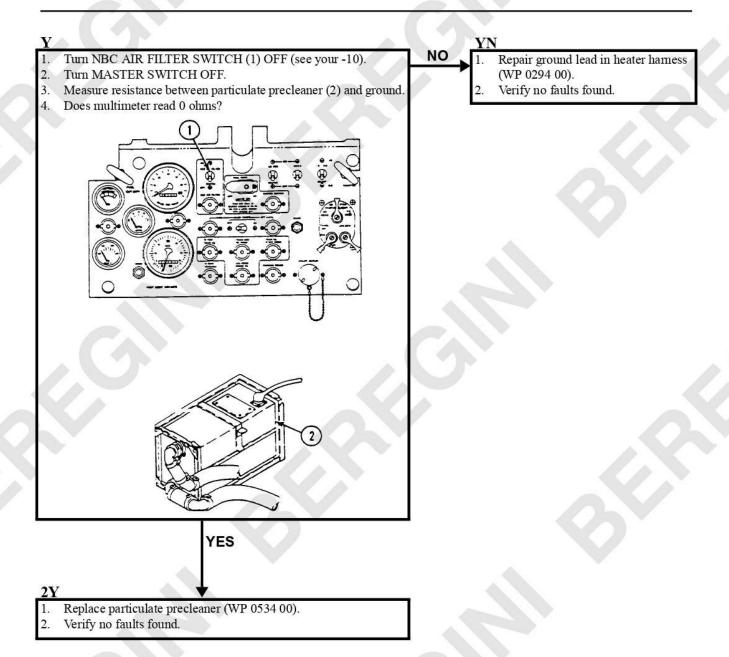
Engine stopped (see your -10)

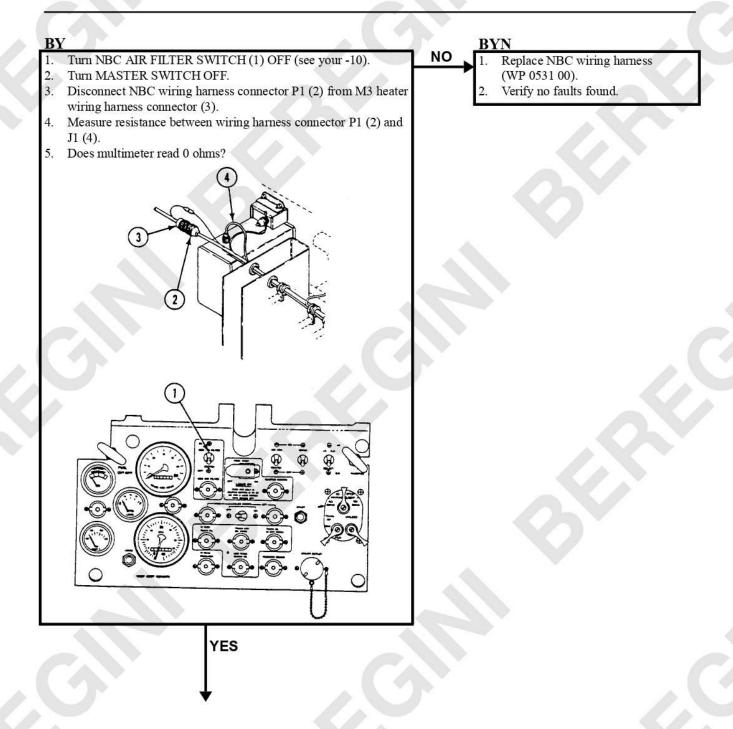
Carrier blocked (see your -10)



YES

PARTICULATE PRECLEANER MOTOR DOES NOT WORK (M548A3)—Continued

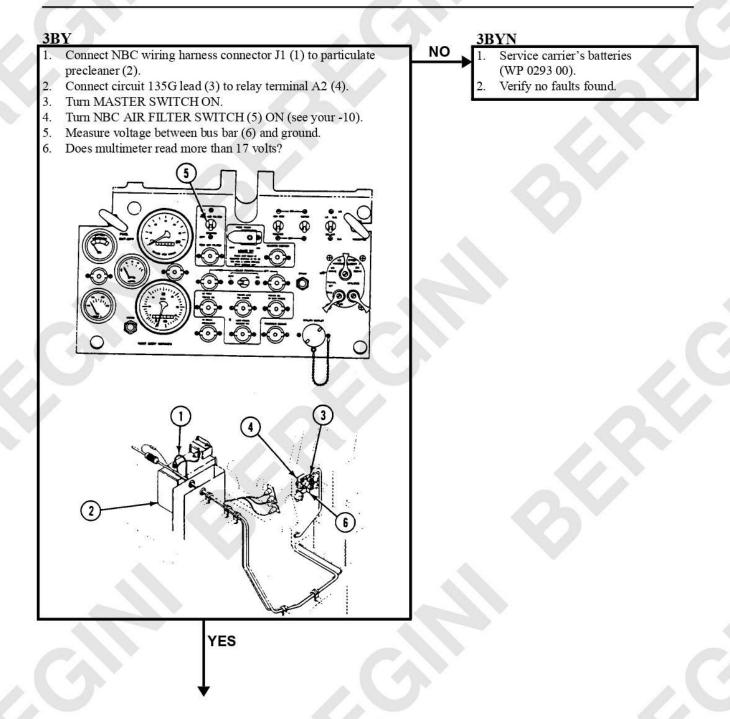




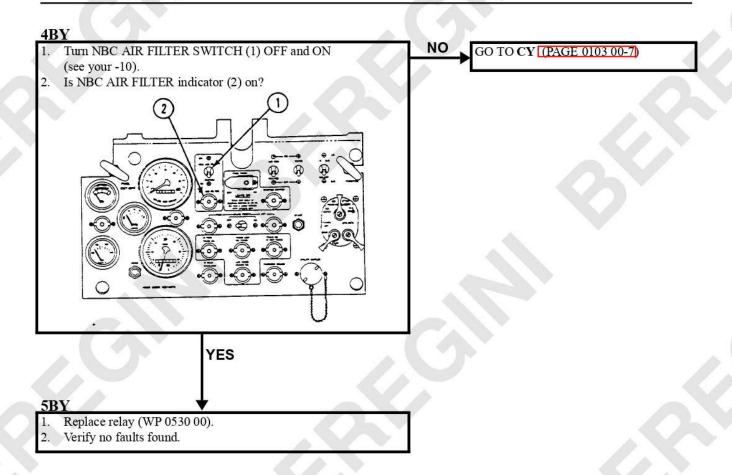
PARTICULATE PRECLEANER MOTOR DOES NOT WORK (M548A3)—Continued

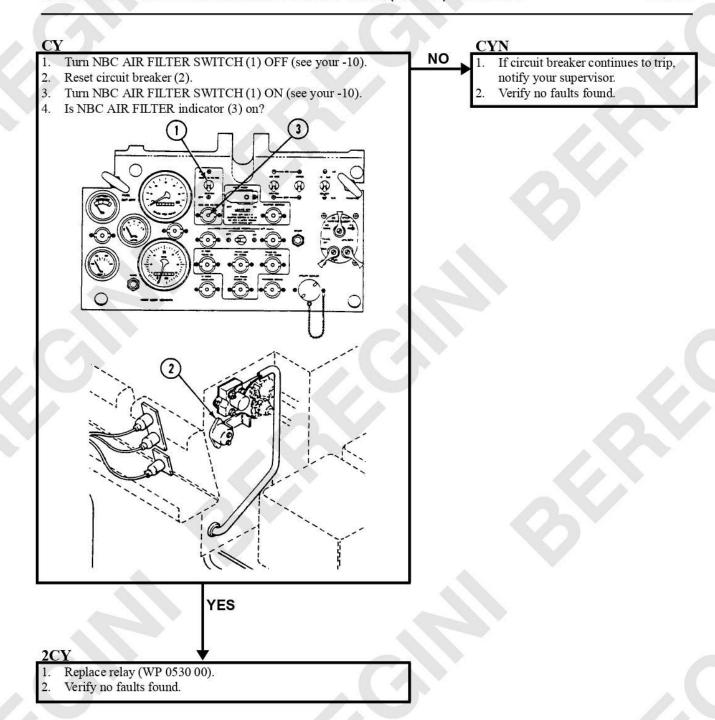
010300

2BY 1. Connect NBC wiring harness connector P1 (1) to M3 heater wiring harness connector (2). 2. Remove circuit 135G lead (3) from relay terminal A2 (4). 3. Measure resistance between NBC wiring harness connector J1 (5) and circuit 135G lead (3). 4. Does multimeter read 0 ohms? YES



PARTICULATE PRECLEANER MOTOR DOES NOT WORK (M548A3)—Continued







M3 HEATER DOES NOT WORK (M548A3)

0104 00

INITIAL SETUP:

Maintenance Level

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Multimeter (WP 0541 00, Item 29)

Personnel Required

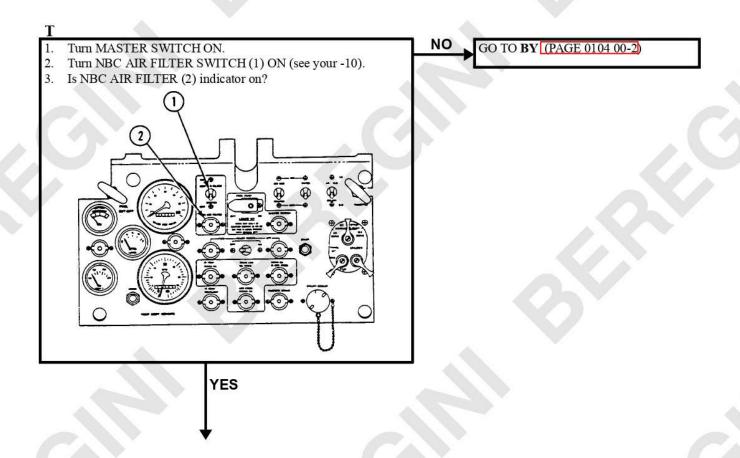
Unit Mechanic

Equipment Condition

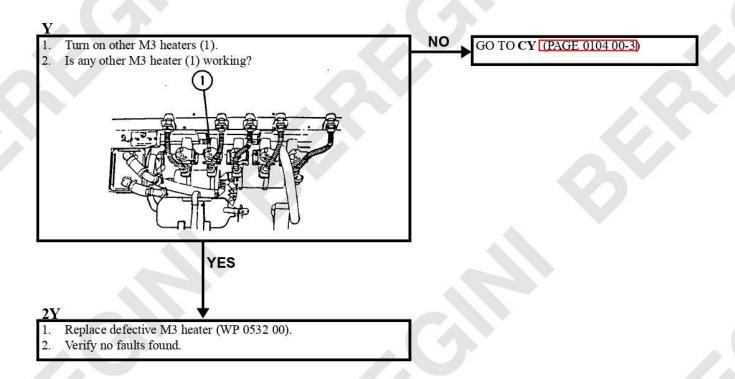
References

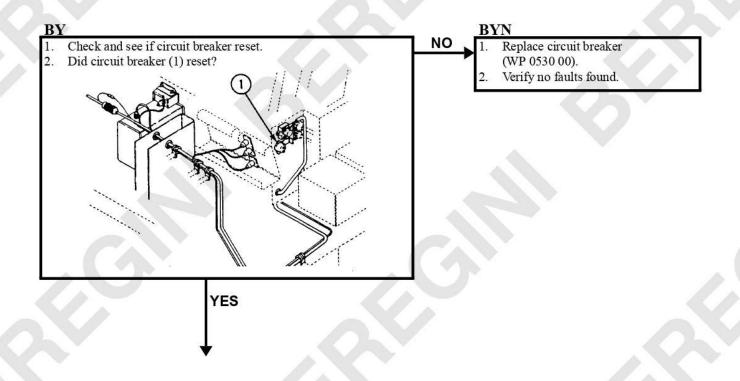
Engine stopped (see your -10)

Carrier blocked (see your -10)



M3 HEATER DOES NOT WORK (M548A3)—Continued

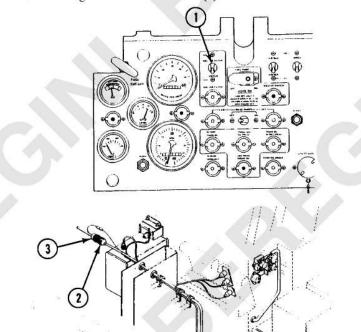




NO

1. 2.

- . Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
- 2. Turn MASTER SWITCH OFF.
- 3. Disconnect NBC wiring harness connector P1 (2) from M3 heater wiring harness connector (3).
- 4. Turn MASTER SWITCH ON.
- 5. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
- 6. Measure voltage between any pin of NBC wiring harness connector P1 (2) except pin H and ground.
- 7. Does multimeter read 17 or more volts from more than one pin of NBC wiring harness connector P1 (2)?



GO TO DY (PAGE 0104 00-5)

YES

Turn NBC AIR FILTER SWITCH (1) OFF (see your -10). Turn MASTER SWITCH OFF. Connect NBC wiring harness connector P1 to M3 heater wiring harness connector. Disconnect any circuit lead 135 (2) from M3 heater (3). Turn MASTER SWITCH ON. Turn NBC AIR FILTER SWITCH (1) ON (see your -10). Measure voltage between circuit lead 135 (2) and ground. Does multimeter read 17 or more volts?

2CYN

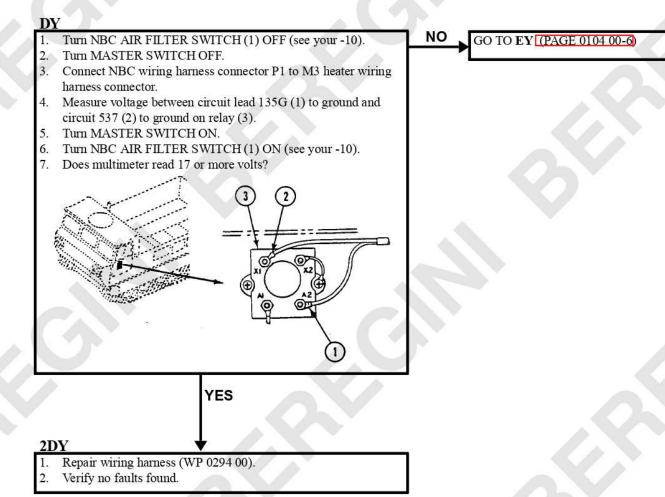
NO

- Repair NBC wiring harness (WP 0294 00).
- 2. Verify no faults found.

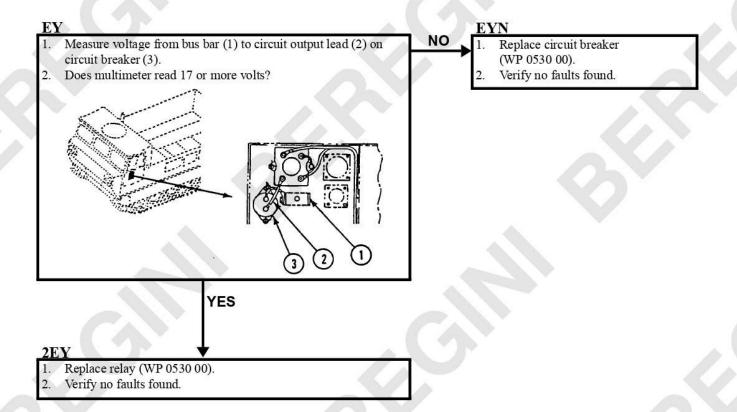
Replace defective M3 heater (WP 0532 00).

YES

Verify no faults found.



M3 HEATER DOES NOT WORK (M548A3)—Continued



NO AIR FLOW AT ONE OR MORE OUTLETS (M548A3)

0105 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

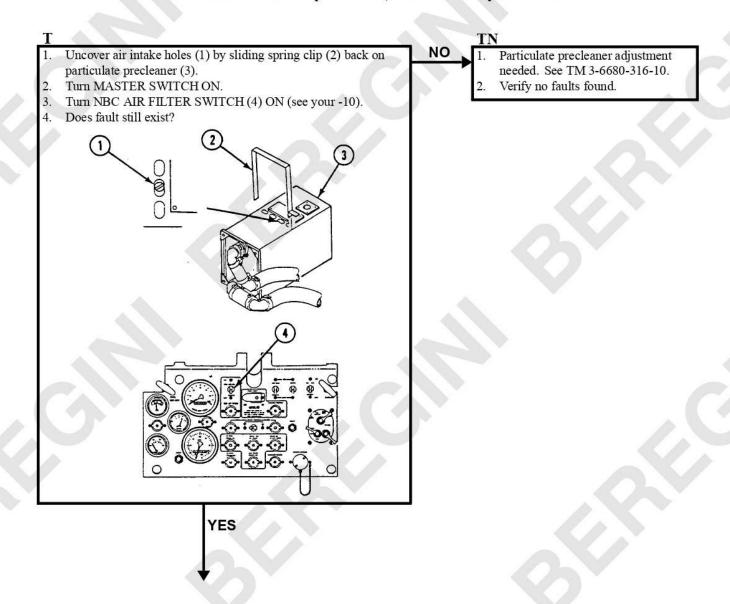
See your -10 TM 3-6680-316-10

Equipment Condition

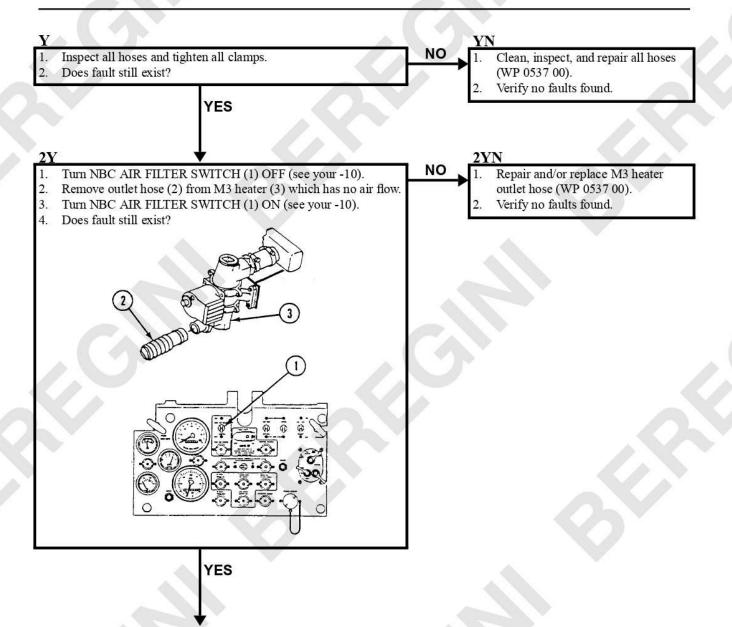
Engine stopped (see your -10) Carrier blocked (see your -10)

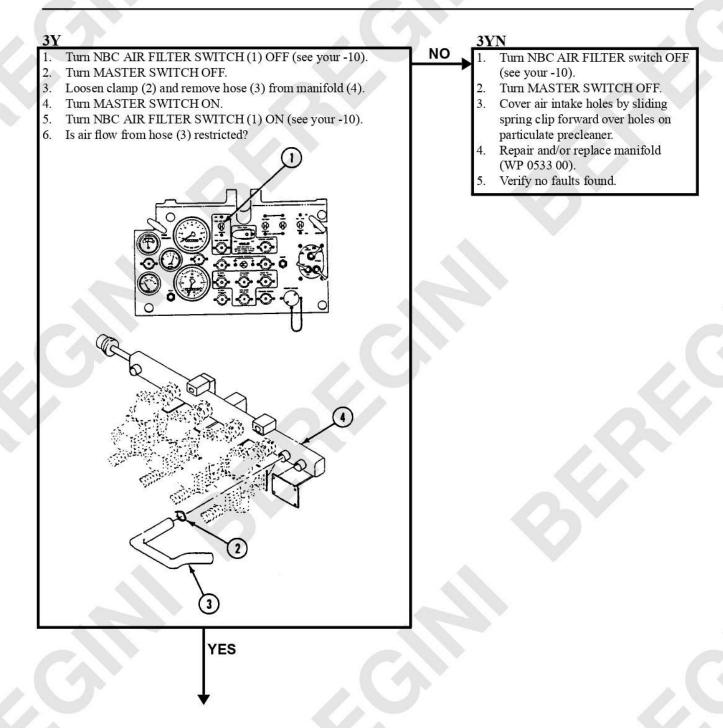
NOTE

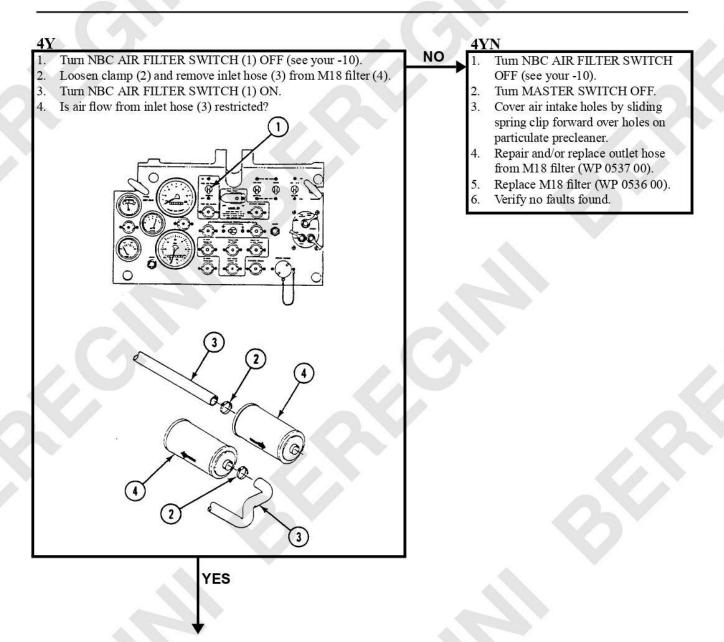
Where more than one component exists, troubleshoot one path at a time.

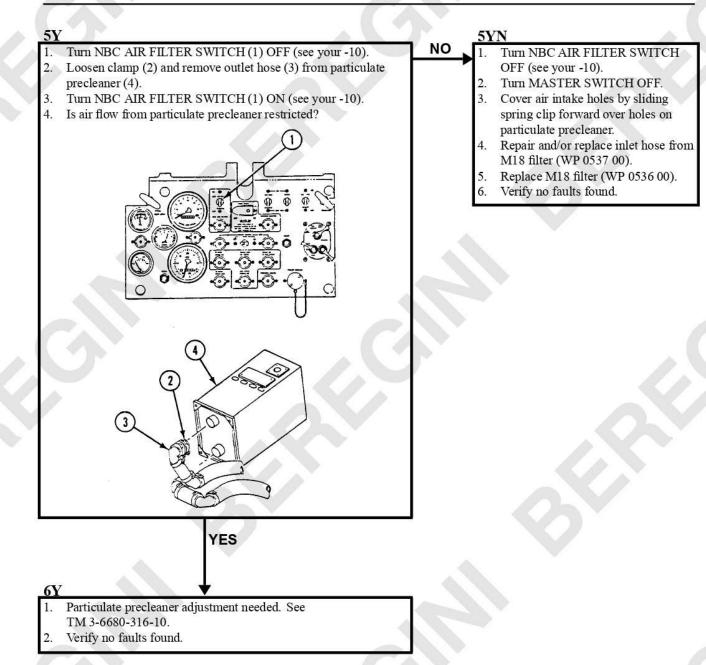


NO AIR FLOW AT ONE OR MORE OUTLETS (M548A3)—Continued











LOW AIR FLOW AT ALL OUTLETS (M548A3)

0106 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

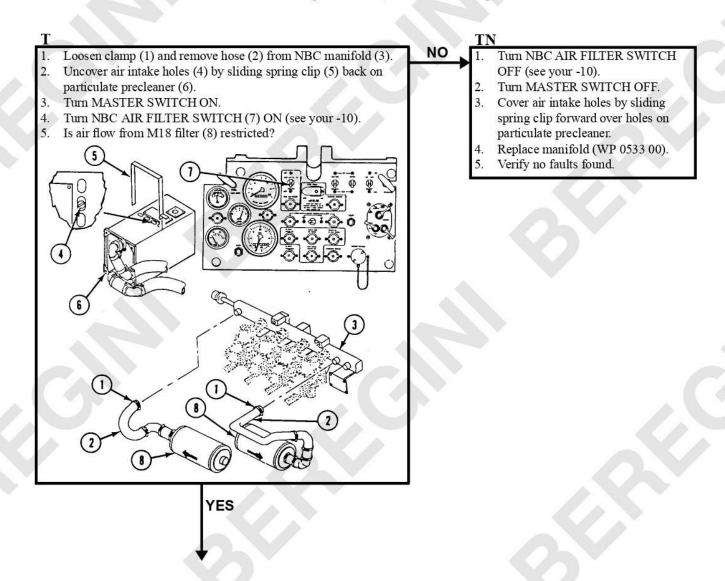
See your -10 TM 3-6680-316-10

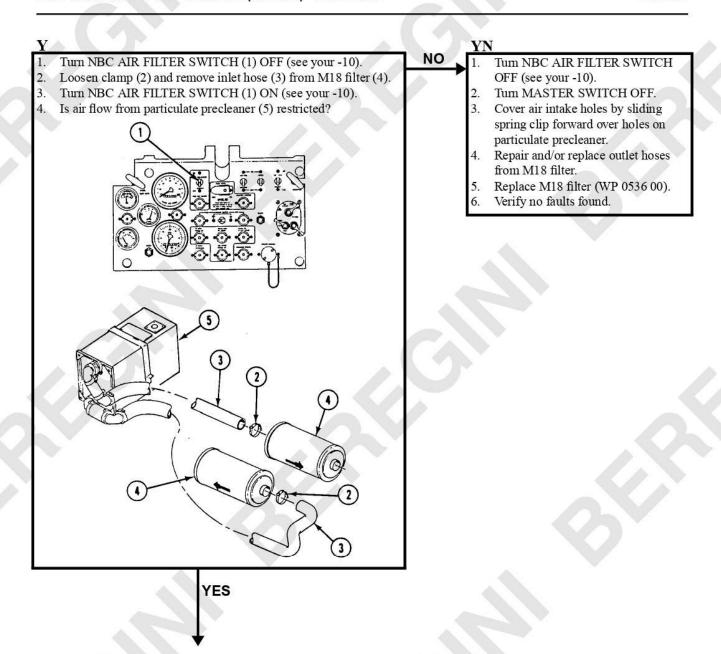
Equipment Condition

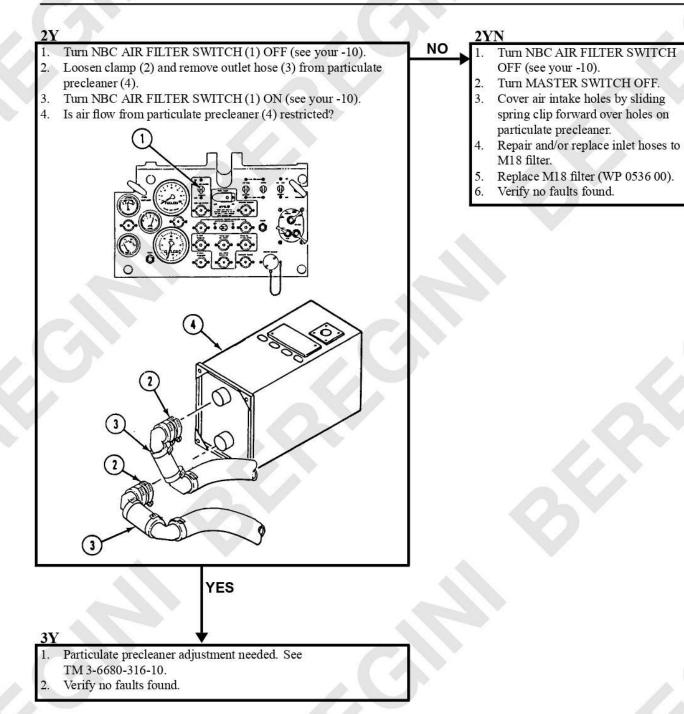
Engine stopped (see your -10) Carrier blocked (see your -10)

NOTE

Where more than one component exists, troubleshoot one path at a time.









0107 00

GENERAL

STE/ICE-R, a testing system for internal combustion engines, provides measurements on voltage resistance, pressure, temperature and speed to analyze the condition of an engine system.

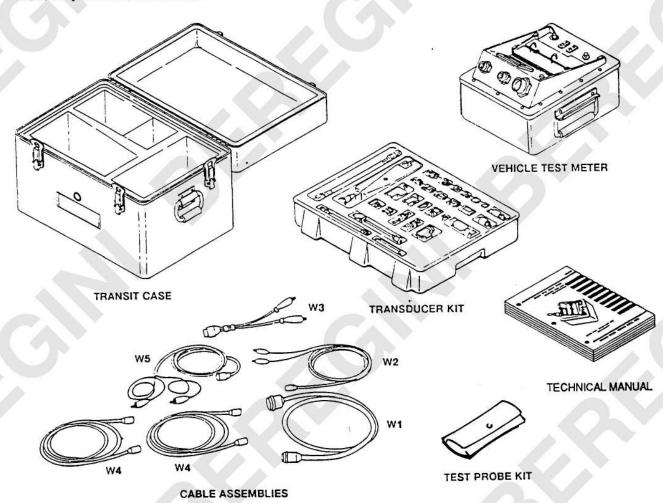
STE/ICE-R, a testing system for internal combustion engines, provides measurements on voltage resistance, pressure, temperature and speed to analyze the condition of an engine system.

This section provides a general overview of STE/ICE-R equipment and operations, along with specific procedures in diagnosing and isolating malfunctions of the M548A1 or M548A3 engine.

STE/ICE-R will also provide a thorough preventative maintenance check on the M548A1 or M548A3 engine as part of service upon receipt and as an annual check in the PMCS.

DESCRIPTION OF STE/ICE-R EQUIPMENT

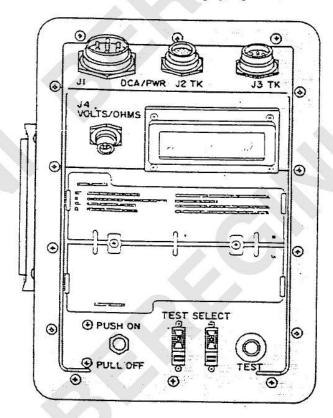
The STE/ICE-R set consists of a vehicle test meter (VTM), five cable assemblies, transducer kit (TK), TM 9-4910-571-12&P manual, test probe kit and transit case.



010700

Vehicle Test Meter (VTM)

The VTM is the diagnostic meter of STE/ICE–R used for testing electrical and mechanical components of the M548A1 or M548A3 engine. The VTM consists of three switches, a readout display, flip cards, and four cable connectors.



a. SWITCHES.

The three switches are a PUSH ON/PULL OFF switch, TEST SELECT switch and TEST button. The PUSH ON/PULL OFF switch is used to control power to the VTM from the power source. The TEST SELECT switch are two ten-position switches used to select the test to be performed. The TEST button has two functions: (1) when pressed and released, it initiates selected test; (2) when pressed and held, it initiates an offset test.

b. READOUT DISPLAY.

The readout display gives five different types of messages during testing and up to a maximum of four characters per message. The readout display messages can be found on <u>WP 0107 00</u>. The types of messages are:

- error,
- status,
- numerical,
- · prompting, and
- confidence test error.

c. FLIP CARDS.

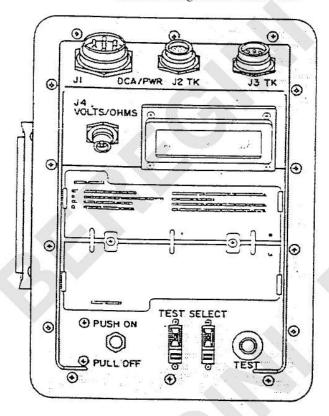
The flip cards, attached to the front of the VTM, provide a quick but limited reference for the operator. These flip cards list test numbers, messages, and some procedures. Test limits are also provided for some vehicles.

0107 00

d. CABLE CONNECTORS.

The four cable connectors on the VTM are DCA/PWR J1, transducer cable connectors J2 TK and J3 TK, and VOLTS/OHMS J4.

- DCA/PWR connector J1 used to connect VTM to either a vehicle diagnostic connector with the DCA cable W1 or to a DC power source with the power cable W5. The DC power source is usually the vehicle's batteries.
- Transducer cable connectors J2 TK and J3 TK used to connect transducer cables W4 to VTM. Power and signals are routed through these connectors. Both connectors may be used when a test requires two measurements to be made at the same time.
- VOLTS/OHMS connector J4 used to connect test probe cable W2 to VTM for voltage and resistance tests.



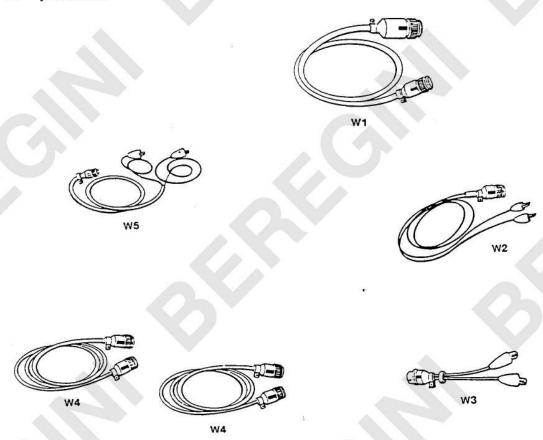
010700

Cable Assemblies

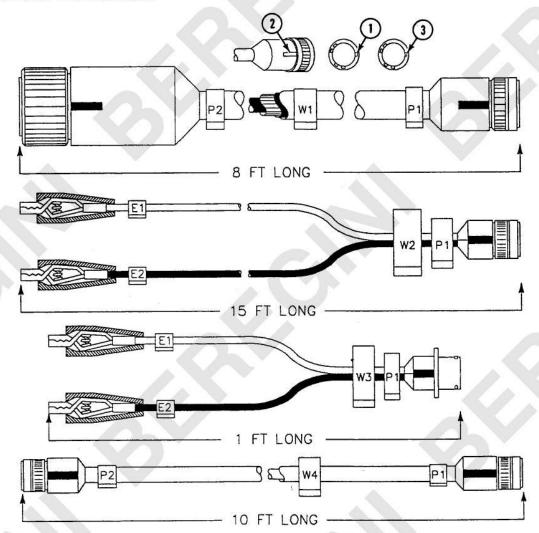
In procedures in this manual, the cable assemblies are referred to by a number for quick identification. Each cable also has a name which describes its use. A reference to W1, for example, would indicate the DCA cable. Connectors on the cable are identified by a number preceded by either a P or an E, such as P1 or E2.

The cable assemblies included in the STE/ICE-R are:

- W1 DCA cable,
- W2 test probe cable,
- W3 ignition adapter cable,
- W4 transducer cable (two), and
- W5 power cable.



When cables are connected, the large key (1) located by the white stripe (2) on the cable connector mates with large keyway (3) of connector on VTM or transducer.



a. DIAGNOSTIC CNCTR ASSY CABLE W1. The W1 is used to power the VTM and provide access to test points and sensors connected to vehicle/equipment-mounted DCA.

b. TEST PROBE CABLE W2.

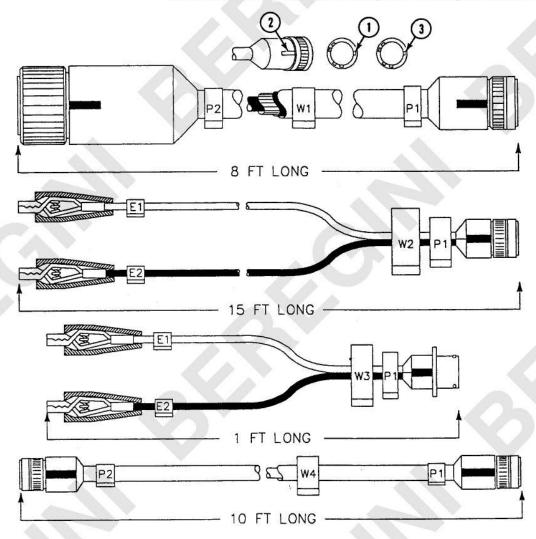
The test probe cable for both general and special measurements. It is used for measuring voltages, frequency, resistance and continuity, and also for the first peak series and compression unbalance tests. W2 is divided into two color coded leads: red for E1 and black for E2. Test clips E1 and E2 of W2 attach to points on the vehicle/equipment being tested.

c. IGNITION ADAPTER CABLE W3. The ignition adapter cable W3 is used in measuring dwell angle, points voltage, engine rpm and power tests. W3 is divided into two color coded leads: red for E1 and black for E2.

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d. TRANSDUCER CABLES W4.

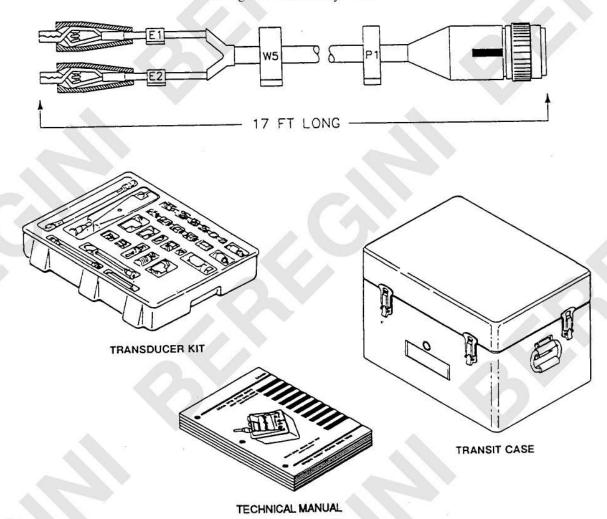
The transducer cables W4 are used as extensions to connect the VTM to a pressure transducer, pulse tachometer, current probe or ignition adapter cable. If necessary, two transducer cables can be joined using connector adapter, TK item 29.



0107 00

e. POWER CABLES W5.

The power cable W5 is used to power the VTM when cable W1 is not being used. Cable W5 is divided into two leads with color coded clips: red for E1 and black for E2. Battery clips E1 and E2 are attached to a vehicle/equipment battery or a 9 to 32 volt 4A regulated power supply. Do not connect the VTM to a battery charger. Damage to the VTM may result.



Transducer Kit (TK)

The TK is a tray inside the transit case that contains transducers, adapters, and fittings. The TK is stored in a molded tray in the top of the case.

Many of the fittings do not have part number markings on them and are referred to by TK item number and name. Each fitting is identified by TK item number and part number.

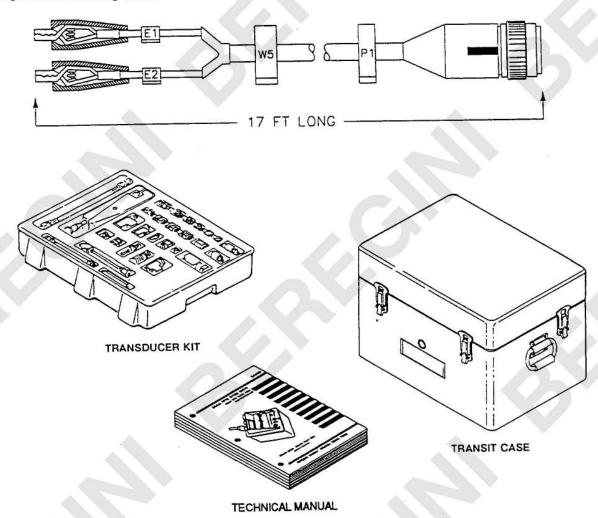
Manual

TM 9-4910-571-12&P contains operating instructions, operator and organizational maintenance instructions, and repair parts and special tools information.

010700

Transit Case

The STE/ICE—R is housed in a portable protective transit case which contains all necessary accessories and instructions. A pressure relief valve located on the front of the case allows the operator to release any pressure or vacuum resulting from changes in climate during transit.



READOUT DISPLAY MESSAGES

Error Messages

Error messages indicate the VTM needs additional or corrected information before testing can continue or additional procedures are required.

All error messages are displayed as an E followed by three numbers (for example, E003).

DISPLAY MEANING

VTM has been asked for information that it does not have. For example, you have requested the vehicle/equipment ID and it has not been entered.

E001	A test number which does not exist has been entered on the TEST SELECT switches.
E002	The required transducer is not connected.
E003	Test number wrong for DCA connected. This can occur if test selected does not apply to the class of vehicle/equipment under test or if the DCA hamess does not have the required transducer.
E004	No longer used. If message appears turn in test set.
E005	Required offset test was not performed.
E007	The VID number and number-of-cylinders information entered do not agree.
E008	VTM is not receiving required voltage signal for selected test. This message can occur on tests, 14, 15, and 72 thru 79.
E009	VTM is not receiving engine speed signal. This applies only to engine power test and SI full power simulation.
E010	A wrong VID number was entered. The VTM will only accept numbers between 01 and 99. If E010 is displayed when the VID entered was between 01 and 99, it means that the VID does not agree with the identity of the DCA harness powering the VTM. The VTM will accept this, allowing you to power through the DCA while testing another vehicle.
E011	Throttle control was operated incorrectly. It was taking too long to accelerate or decelerate during power test.
E012	The SI ignition adapter, TK item 30, or CI pulse tachometer, TK item 34, is missing or is not connected to the VTM.
E013	VTM is unable to use data received.
E014	The wrong number of cylinders was entered.
E015	No longer used. If message appears, turn in test set.
E017	VTM is not receiving ignition information during dwell test.
E018	Test discontinued due to no information being detected by VTM. This will occur after several minutes of no-signal operation.
E020	No first peak information was detected by the VTM.
E021	VTM cannot calculate result. Current is over current probe's range, and VTM did not sample correct portion of data.
E022	External voltage was detected in the circuit under test while measuring resistance.
E023	VTM's constant voltage source is not working.
E024	Test is not valid for VID entered.
E027	Error is entry of compression unbalance constants.
E028	Test just entered cannot be used with control function 06.
E030	VID entered conflicts with speed transducer attached.
E032	Carrier's cranking speed is varying too much for a compression unbalance measurement.

010700

E033	Error in entry of power test constants.

Status Messages

Status messages keep the operator informed of what is happening.

DISPLAY	MEANING
.8.8.8.8	There is power to the VTM, and the display is working properly. This appears only for a short period after power is turned on.
.9.9.9.9	VTM is reading a test value beyond its range.
PASS	Unit under test has passed test, or VTM has accepted a control function entry.
FAIL	Unit under test has failed test.
CON	Accepted control function input.
AUE	Numerical display is an average value.
LO	Engine speed below 1600 rpm during SI power test indicates the engine failed the power test.
-1-1-1-1	VTM is busy.

Numerical Readouts

Units of measurement (psi, rpm, Volts, etc.) are not displayed. Numerical readouts indicate the measured value in units of the measurement being made. For example, if you are measuring 0–45 volts dc, 12.7 is volts dc. If you are measuring 0–25 psig pressure, 12.7 is psig. The units for each test are listed on the flip cards. Also, the readout will alternate between displaying values and displaying vehicle identification data (VID).

Prompting Messages

Prompting messages tell the operator to do something. After the operator action is completed, testing will continue. Some of the prompting messages and their meanings are as follows:

Tells the operator to enter VID on the TEST SELECT switches. CYL Tells the operator to enter the number-of-cylinders into the VTM. GO Tells the operator to crank engine. Tells the operator to set TEST SELECT switches to 99 during confidence test. CAL Tells the operator to release the TEST button during an offset test. Tells the operator to apply full throttle in a CI power test.	DISPLAY	MEANING
Tells the operator to crank engine. Tells the operator to set TEST SELECT switches to 99 during confidence test. Tells the operator to release the TEST button during an offset test.	UEH	Tells the operator to enter VID on the TEST SELECT switches.
Tells the operator to set TEST SELECT switches to 99 during confidence test. CAL Tells the operator to release the TEST button during an offset test.	CYL	Tells the operator to enter the number-of-cylinders into the VTM.
CAL Tells the operator to release the TEST button during an offset test.	GO	Tells the operator to crank engine.
_	0066	Tells the operator to set TEST SELECT switches to 99 during confidence test.
CIP Tells the operator to apply full throttle in a CI power test.	CAL	Tells the operator to release the TEST button during an offset test.
	CIP	Tells the operator to apply full throttle in a CI power test.

Confidence Test Error Messages

Confidence test messages are displayed either as PASS or by a C followed by three numbers (#). A C### is an error message used by VTM repair personnel as an aid in troubleshooting.

If a C### message appears during confidence test or during normal operation, go to confidence test fault isolation, TM 9-4910-571-12&P, for the necessary corrective action.

0107 00

TEST METHOD

The test method consists of a pre-test inspection and STE/ICE-R testing.

Pre-test Inspection

Before using STE/ICE-R to test the carriers, perform the following pre-test inspections:

a. FAN BELTS. Check for proper tension. Replace if cracked of frayed.

b. OIL LEVEL. Bring up to proper level if low.

c. FUEL LEVEL. Check that the fuel tank has enough fuel for testing.

d. RADIATOR. Bring up to proper level if low.

e. BATTERY. Replace the battery if the case is cracked or the terminal posts are damaged. Clean

off all corrosion. Check that the battery connections to ground and starter motor are in good condition, securely connected, and clean. Check the electrolyte level. See

TM 9-6140-200-14. If low, bring up to proper level with distilled water.

Vehicle Test Card (VTC)

Once familiar with STE/ICE-R testing procedures, the vehicle test card (located on (WP 0107 00)) can be used as a quick reference.

The front of the test card contains all of the information, in abbreviated format, that the user will need to perform common measurements on the carrier. The organization from the top of the card to the bottom represents a logical order of steps from powering up the VTM to completing a series of tests.

The top of the card describes the power up sequence of STE/ICE—R for the carrier. Next, a table is provided which lists many measurements that are useful in troubleshooting the carrier. The table includes the associated VTM test number, any required offset test limits, operating condition of the engine, special connections required, the expected limits for pass or fail, and the units of measurement. Also included on the front of the card are hook-up diagrams.

The organization of the table allows measurements with the carrier engine turned off to be performed first. These measurements will ensure that the starting system of the carrier is in working order before proceeding. The order of the other measurements is as follow:

Measurements with the engine running but not warm.

Measurements requiring the engine to be warm and running.

Measurements requiring the engine to be warm and not running.

Miscellaneous measurements.

The back of the VTC contains the hookups for measurements used to troubleshoot carrier components. Measurements that require special hookups are also included on this side of the VTC.

STE/ICE-R ENGINE TROUBLESHOOTING METHOD

When a malfunction in the engine is recognized by the mechanic, the "flip cards to Troubleshooting" will provide a reference to a specific procedure to isolate the cause of the malfunction.

To start the STE/ICE-R engine troubleshooting method, do the following:

a. PERFORM HOOK UP. First, perform HOOK UP to set up STE/ICE-R and check to see if it is in working

order.

b. PERFORM Now that STE/ICE—R is hooked up properly and checks out, perform the procedure

PROCEDURE. cited in the "Quick Guild Troubleshooting."

The rules to follow when using STE/ICE-R engine troubleshooting method are:

(1) Never enter in the middle of a procedure.

010700

- (2) Follow each instruction in a procedure. Do not skip any instructions or procedures.
- (3) After correcting a problem with a procedure, test run the component, engine or power plant to ensure the problem does not still exist.

BATTERY TEST CARDS

The STE/ICE—R battery test procedures allow the user to evaluate the condition and state of charge of carrier/equipment batteries. These procedures use the battery internal resistance and battery resistance change measurements. Battery internal resistance evaluates the state of charge of the battery. Battery resistance change evaluates the battery condition.

Battery state of charge is a measure of the amount of energy stored in the battery. A fully charged battery contains the maximum amount of energy stored. If the battery fails the battery state of charge evaluation, the battery may be recharged to return the battery to full charge.

The battery condition is a measure of the battery's ability to accept and maintain a good charge. A battery in poor condition may be able to be fully recharged. However, a battery in poor condition with a full charge will lose its charge more quickly than a better in good condition with a full charge. If a battery fails the battery condition evaluation, then the battery should be replaced.

The procedures for testing batteries are listed on three battery test cards. Each card describes procedures for evaluating different combinations of batteries:

Complete battery pack, Series pair of batteries, and Individual batteries.

BATTERY PARKS

A battery pack is the combination of four or more batteries in a particular circuit of a carrier/equipment, i.e. the starting circuit. Testing the batteries in a pack evaluates the general condition of the pack as a whole. Note, the results of a battery pack test may be misleading. A single battery from a pack of four may be bad even though the pack as a whole may pass the tests. This can happen if the other three batteries in the pack are in very good condition. In order to test a battery pack, the current probe must be clamped around a single cable carrying all of the starter current. If such a connection cannot be made, then test each pair of batteries separately.

SERIES PAIRS

A series pair is one in which the negative terminal of one battery is connected by a cable to the positive terminal of another battery. This test configuration should be used when any of the following conditions exists:

There are only two batteries (one series pair) in the carrier/equipment.

An evaluation of the pack is desired, but the current probe cannot measure the total starter current. This condition can occur if the cable is not readily accessible or if the cable is physically too large.

The battery pack test has failed, and the user wants to further identify any bad battery pair.

Note: Testing each series pair yields a better evaluation than testing the pack as a whole.

INDIVIDUAL BATTERIES

An individual battery test refers to the process of testing one battery at a time. The battery could be part of a pack, a series pair, or a single battery. Test the batteries individually if a battery series pair failed the tests and it is desired to isolate to a single battery (or if there is only one battery in the circuit). Testing individual batteries gives the best evaluation.

DESCRIPTION OF TEST CARDS

The front of each test card has three sections. The top of the card explains how to connect the VTM to the batteries being tested. The middle part of the card describes the procedure to follow in order to evaluate the batteries. The bottom of the card contains illustrations showing typical carrier hookups.

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The back of each card also has three sections. The upper left-hand block lists the possible VTM displays and explains their meanings. This block suggests corrective action for the user. The right-hand side of the card contains battery test limits for three common military batteries. These limits may be used if the carrier/equipment TM does not provide limits. The lower left-hand portion of the card contains a table showing how to apply the limits to evaluate the battery condition and state of charge.

BATTERY EVALUATION PROCEDURE

Use Procedures On Battery Test Card To Hook-up VTM.

The following information will enable the user to determine the correct tests:

Use series 73 and 75 for the following conditions:

- (1) Testing a battery pack that is also powering the VTM.
- (2) Testing a battery series pair that is also powering the VTM.
- (3) Testing an individual battery that is the only battery in the circuit and is powering the VTM.

Use series 77 and 79 for the following conditions:

- (1) Testing a battery pack that is not powering the VTM.
- (2) Testing a battery series pair that is not powering the VTM.
- (3) Testing an individual battery that is not the only battery in a circuit or is not powering the VTM.

Use Test Procedure On Battery Test Card To Complete Evaluation.

Evaluate battery condition using battery resistance change test (#75 or #79). Note the result.

Evaluate battery state of charge using the battery internal resistance test (#73 or #77). Note the result.

Compare test results to limits in carrier/equipment TM. If carrier/equipment TM does not have test limits, use test limits provided in this section. If the battery internal resistance test passes, then the batteries are fully charged. If the battery internal resistance test fails, then the batteries are not adequately charged. If the battery resistance change test passes, then the batteries are good and will retain their charge. If the battery resistance change test fails, then the batteries are bad and will not retain their charge.

If batteries are out of limits, perform one or all of the following:

- (1) Check battery electrolyte level.
- (2) Check battery connections and terminals. Clean or tighten if necessary. Check connections between VTM and batteries.
- (3) Refer to carrier/equipment TM to check battery specific gravity.
- (4) Repeat battery resistance change and internal battery resistance tests one time. If internal battery resistance result (test #73 or #77) is out of limits, then charge batteries. If battery resistance change result (test #75 or #79) is out of limits, then continue testing to isolate bad batteries.

010700

PRE-TEST INSPECTION

- Fuel Level
- Fan Beils Oil Level Coolant Level

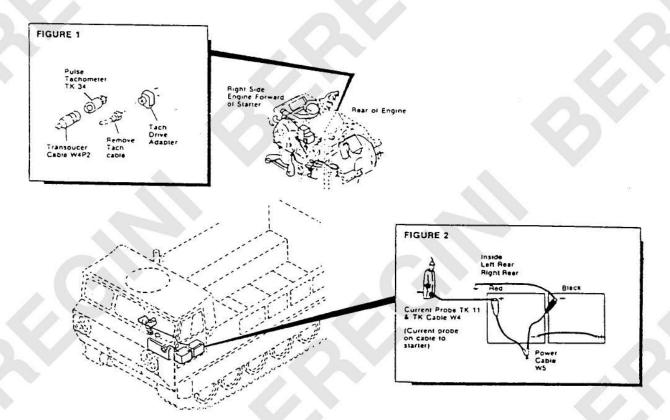
POWERING UP VTM

- Connect VTM to W5 cable W5 cable attaches to batteries as shown in figure 2
 Enter VID into VTM using lest 60
 Perform confidence test, test 66 (second entry 99)

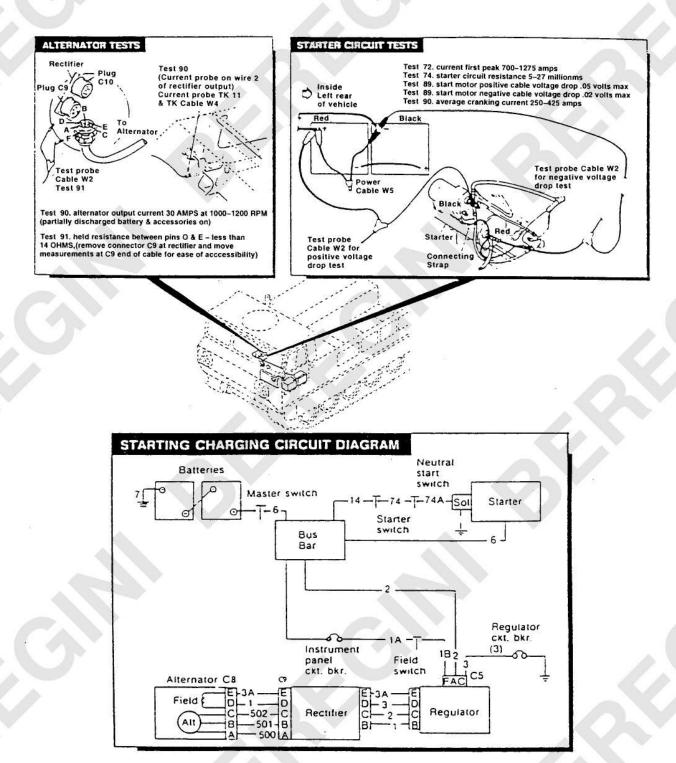
MEASUREMENT NAME	입니다. 그런데 살린다 하다. 그리지 나라 하다 아버지를 맞았다.	VTM OFFSET	OPERATING CONDITION	SPECIAL CONNECTIONS REQUIRED	LIMITS		
		LIMITS			MIN	MAX	UNITS
Battery Voltage	67		Engine oil	A-104-5 320	22		
Current First Peak	72	1225	Crank on GO	Current prope - figure 2		1275	Voits
Vehicle Oil Pressure Warning Light	_	-4	Idle-use test 10 to check idle speed	Puise tachometer — liqure 1	1000000	I Goes	Amas
Charging Vottage	01 67	A - /	Lights & accessories on 1000-1200 RPM	Puise lachometer - liqure 1	26.5	Discourse College	
Venicle Gage Coolant Temp	_		Warm engine	- orse recommender - rigore 1	120	7.000	Voits
Engine RPM (Average)	10		Governor	Pulse lacnometer - liqure 1	10000000	185	100
Power	13	_	Engine warm	Pulse Ischometer — liquie I	75	3000	RPM
Engine RPM (Average)	10	-	Idie	Pulse Ischometer - liqure 1	650	700	200
Compression Unbalance	14	_	Warm Engine - Crank on GO	ruise tacriometer - tigure 1	030	700	RPM
Cranking APM	10		Cranking	Pulse lachometer — liqure 1	100	•	RPM
Cranking Voltage	67	_	Cranking	roise racionneler - rigore i	F 6.5 (5.00)	·	100000
Cranking Current	90	: 225	Cranking	Current prope - figure 2	18	425	Vons
Battery Pack Internal Resistance	73	1225	Crank on GO	Current prope - liquie 2	250	0.000	Amps Millionms
Starter Circuit Resistance	74	• 225	Crank on GO	Current prope - liquie 2	-		Millionma
Ballery Pack Resistance Change	75	± 225	Crank on GO	Current probe - liquie 2	3		Millionms/sec

Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications. If test limits are different, use vehicle TM's specifications.

* If venicle has a turbocharger or fuel limiter, go to venicle TM for procedure to do power test



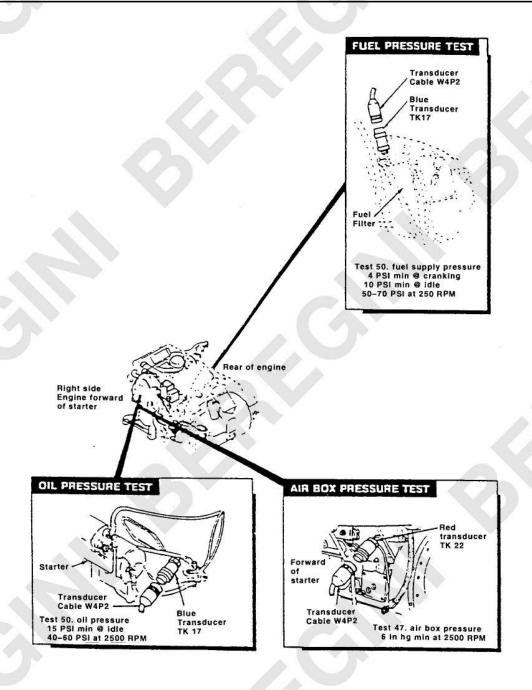
M113 (M548A1) VEHICLE TEST CARD - VID 03



Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications.

if test limits are different, use vehicle TM's specifications.

M113 (M548A1) VEHICLE TEST CARD - VID 03 ADDITIONAL TEST CONNECTIONS



Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications. If test limits are different use vehicle TM's specifications.

M113 (M548A1) VEHICLE TEST CARD - VID 03 ADDITIONAL TEST CONNECTIONS

010700

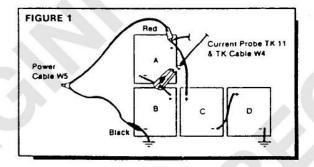
THE BATTERY INTERNAL RESISTANCE TEST (73 or 77) evaluates the state of charge of the battery series pair. The BATTERY RESISTANCE CHANGE TEST (75 or 79) evaluates whether the battery is good or bad, even if it is discharged. A good battery that is discharged may be recharged. A bad battery may hold a charge for a short time.

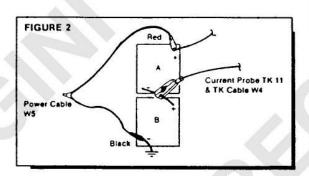
STE/ICE HOOKUP

- 1. The power to operate the STE/ICE-R VTM may be taken from the batteries being tested as shown in the appropriate figure below or from an alternate power source (such as another vehicle's batteries).
- 2. Perform VTM general setup, run confidence test, and enter vehicle ID
- Find a series pair of batteries. A battery series pair has the negative terminal of one battery connected to the positive terminal of another battery by a cable. For example, in figures 1 and 2 below, batteries A and B are a series pair; and in figure 1 below batteries C and D are a series pair.
- a If power to the VTM comes from a different set of batteries than the batteries under test, use tests 77 and 79 instead of tests 73 and 75. Connect test probe cable W2 to the batteries under test. Connect the red clip to the positive terminal closest to the starter and the black clip lead to the negative terminal closest to the ground.
- b. If power to the VTM comes from the same set of batteries as the batteries under test, use tests 73 and 75. The test probe cable W2 is not used
- 5 Clamp the current probe around the cable connecting the two batteries. Point the arrow of the current probe along the cable leading towards the negative battery terminal as shown below in figures. 1 and 2 for batteries A and B.

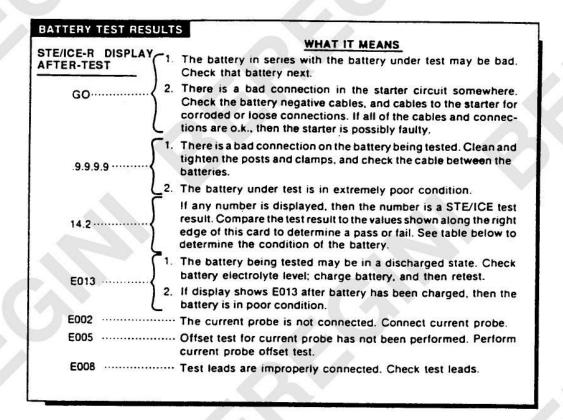
TEST PROCEDURE

- 1 Condition the current probe before running these tests
- 2. Measure the battery resistance change by entering test number 75 or 79 (as described in the hookup procedure). Then engage the starter for about 5 seconds.
- 3 Measure the battery internal resistance by entering test number 73 or 77 (as described in the hookup procedure). Then engage the starter for about 5 seconds.
- 4. Compare the results of both measurements to limits in the vehicle/equipment TM or to limits on the reverse side of this curd
- If either measurement is outside of normal limits, check battery terminals and connections, and check battery electrolyte level. Then perform both measurements a second time.
- If the battery resistance change test (75 or 79) fails after the second measurement, then the battery series pair is in bad condition. Test each battery individually to determine which is good and which is bad or replace the battery series pair.
- 7. If the battery internal resistance test (73 or 77) fails after the second measurement, then the batteries should be recharged





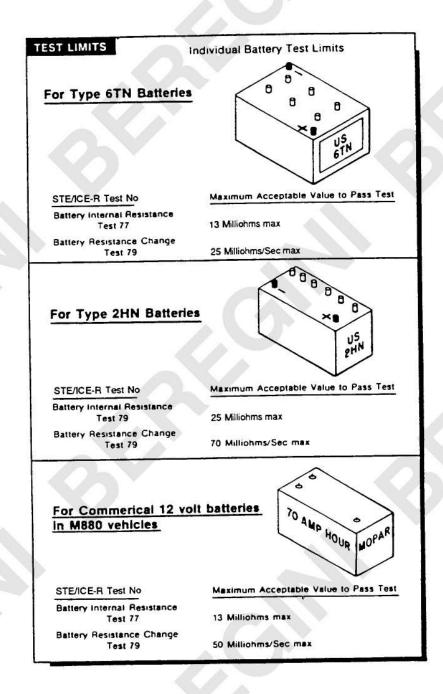
STE/ICE-R BATTERY SERIES PAIR TEST CARD



BATTERY CONDITION

TEST 77 BATTERY INTERNAL RESISTANCE TEST RESULT	TEST 79 BATTERY RESISTANCE CHANGE TEST RESULT	BATTERY CONDITION	
PASS	PASS	The battery tested is o.k. and in good state of charge.	
PASS	FAIL	The battery tested is in poor condition, but has a fresh charge.	
FAIL	PASS	The battery tested is o.k., but needs to be recharged.	
FAIL	FAIL	The battery tested is in poor condition and in a state of discharge.	

STE/ICE-R INDIVIDUAL BATTERY TEST CARD



STE/ICE-R INDIVIDUAL BATTERY TEST CARD

010700

The BATTERY INTERNAL RESISTANCE TEST (73 or 77) evaluates the state of charge of an individual battery. The BATTERY RESISTANCE CHANGE TEST (75 or 79) evaluates whether the battery is good or bad, even if it is discharged. A good battery that is discharged bay be recharged. A bad battery may hold a charge for a short time.

STE/ICE HOOKUP

- 1 The power to operate the STE/ICE-R VTM may be taken from the batteries being tested as shown in the appropriate figure below or from an alternate power source (such as another vehicle's batteries).
- 2. Perform VTM general setup; run confidence test and enter vehicle ID.
- 3 If there is more than one battery in the vehicle/equipment, then find the battery series pair that includes the battery under test. A battery series pair is a pair of batteries for which the negative terminal of one battery is connected by a cable to the positive terminal of another battery. For example, in figure 1 and 2 below, batteries A and B are a series pair, and in figure 1 below, batteries C and D are a series pair.
- 4 a If the vehicle/equipment under test has more than one battery or if the VTM is powered from an alternate power source, then use tests 77 and 79. Connect the red clip of test probe cable W2 to the positive terminal of the battery under test. Connect the black clip of test probe cable W2 to the negative terminal of the battery under test.
- b. If the vehicle/equipment under test has only one battery which is also supplying power to the VTM, use tests 73 and 75. The test probe cable W2 is not used.
- 5. a. If the vehicle/equipment under test has more than one battery, then the battery under test is part of a series pair of batteries. Clamp the current probe around the cable connecting the series pair. Point the arrow on the current probe along the cable leading towards the negative terminal as shown in figures 1 and 2.
- b. If the vehicle/equipment under test has only one battery, then clamp the current probe around the positive battery cable connected to the starter. Point the arrow on the current probe along the cable in the direction leading towards the starter as shown in figure 3.

TEST PROCEDURE

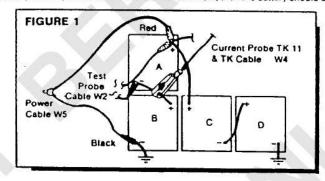
- 1 Condition the current probe before running these tests
- 2 Measure the battery resistance change by entering test number 75 or 79 (as described in the hookup procedure). Then engage the starter for about 5 seconds.

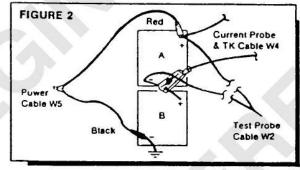
Measure the battery internal resistance by entering test number 73 or 77 (as described in the hookup procedure). Then engage the starter for about 5 seconds.

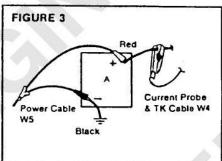
Compare the results of both measurements to limits in the vehicle/equipment TM or to limits on the reverse side of this card

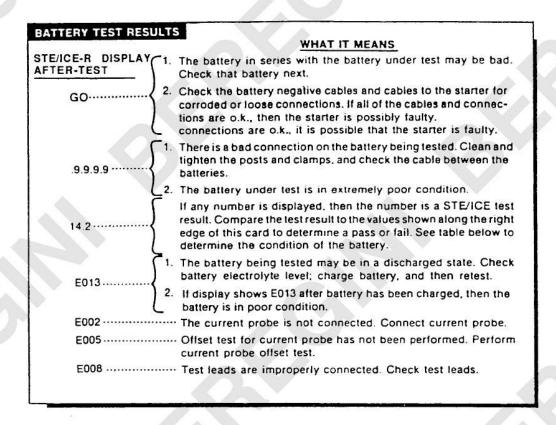
If either measurement is outside of normal limits, check battery terminals and connections, and check battery electrolyte level. Then perform both measurements a second time.

- If the battery resistance change test (75 or 79) fails after the second measurement, then the battery is in bad condition. The battery may be able to
 accept and hold a charge, but it will quickly become discharged during use. A battery in bad condition should be replaced.
- If the battery internal resistance test (73 or 77) fails after the second measurement, then the battery should be recharged





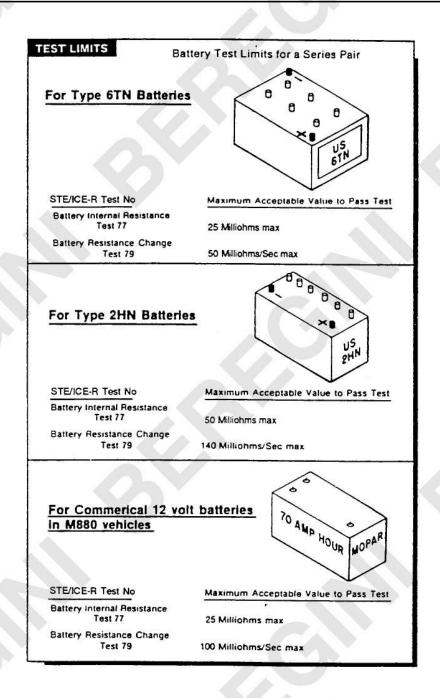




BATTERY CONDITION

TEST 77 BATTERY INTERNAL RESISTANCE TEST RESULT	TEST 70 BATTERY RESISTANCE CHANGE TEST RESULT	BATTERY CONDITION	
PASS	PASS	The battery tested is 0 k. and in good state of charge.	
PASS	FAIL	The battery tested is in poor condition, but has a fresh charge	
FAIL	PASS	The battery tested is o.k., but needs to be recharged.	
FAIL	FAIL	The battery tested is in poor condition and in a state of discharge.	

STE/ICE-R BATTERY SERIES PAIR TEST CARD



STE/ICE-R BATTERY SERIES PAIR TEST CARD

010700

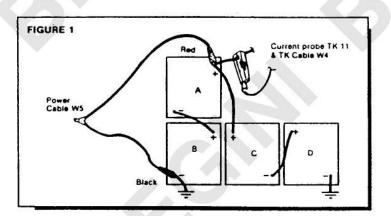
The BATTERY INTERNAL RESISTANCE TEST (73 or 77) evaluates the state of charge of an individual battery. The BATTERY RESISTANCE CHANGE TEST (75 or 79) evaluates whether the battery is good or bad, even if it is discharged. A good battery that is discharged bay be recharged. A bad battery may hold a charge for a short time.

STE/ICE HOOKUP

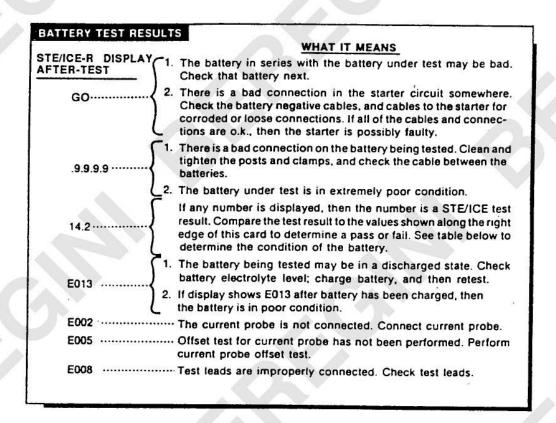
- The power to operate the STE/ICE-R VTM may be taken from the batteries being tested as shown in the appropriate figure below or from an alternate power source (such as another vehicle's batteries).
- 2. Perform VTM general setup; run confidence test, and enter vehicle ID.
- a. If power to the VTM comes from a different set of batteries than the battery pack under test, use tests 77 and 79. Connect test probe cable W2 to the
 battery pack under test, Connect the red clip to the positive terminal closest to the starter. Connect the black clip to the negative terminal closest
 to vehicle/equipment ground.
 - b. If power to the VTM comes from the battery pack under tests, use tests 73 and 75. The test probe cable W2 is not used.
- Clamp the current probe around the positive cable connected to the starter. Point the arrow on the current probe along the cable leading towards the starter as shown in figure 1.

TEST PROCEDURE

- Condition the current probe before running these tests.
- Measure the battery resistance change by entering test number 75 or 79 (as described in the hookup procedure). Then engage the starter for about 5 seconds.
- Measure the battery internal resistance by entering test number 73 or 77 (as described in the hookup procedure). Then engage the starter for about 5 seconds.
- 4. Compare the results of both measurements to limits in the vehicle/equipment TM or to limits on the reverse side of this card.
- 5 If either measurement is outside of normal limits, check battery terminals and connections, and check battery electrolyte level. Then perform both measurements a second time.
- If the battery resistance change test (75 or 79) fails after the second measurement, then the battery pack is in bad condition. Test each series pair to determine which is good and which is bad.
- 7. If the battery internal resistance test (73 or 77) fails after the second measurement, then the battery should be recharged



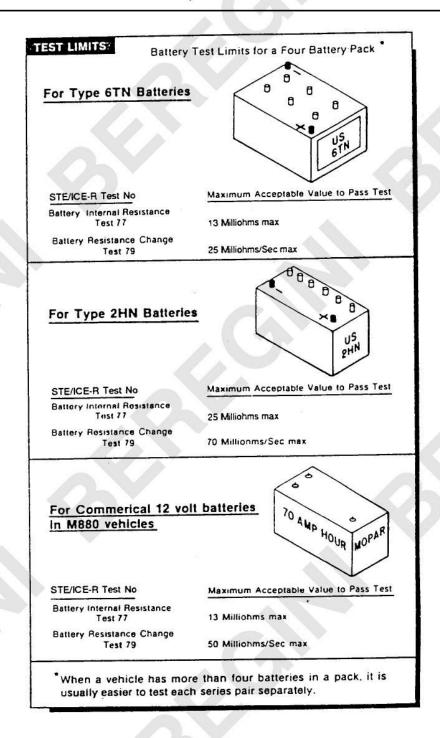
STE/ICE-R BATTERY PACK TEST CARD



BATTERY CONDITION

TEST 77 BATTERY INTERNAL BESISTANCE TEST RESULT	TEST 78 BATTERY RESISTANCE CHANGE TEST RESULT	BATTERY CONDITION		
PASS	PASS	The battery tested is o.k and in good state of charge.		
PASS	FAIL	The battery tested is in poor condition but has a fresh charge		
FAIL	PASS	The battery tested is o.k., but needs to be recharged.		
FAIL	FAIL	The battery tested is in poor condition and in a state of discharge.		

STE/ICE-R BATTERY PACK TEST CARD



STE/ICE-R BATTERY PACK TEST CARD



STE/ICE-R CHARGING CIRCUIT TROUBLESHOOTING

0108 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10 TM 9-4910-571-12&P (WP 0023 00)

Equipment Condition

NO

Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door/panel removed
(see your -10)

STE/ICE-R hooked up for power (WP 0114 00)

CONDITION CURRENT PROBE

- 1. Clamp current probe around battery positive cable.
- 2. Point arrow on current probe toward starter and clamp probe on battery positive cable to starter.
- 3. Ensure current probe is closed.
- 4. Crank engine for several cycles with fuel off.
- 5. Turn off all electrical power.
- 6. Set test select switches to 90.
- 7. Press and hold test until CAL appears on display.
- 8. Is offset value within limits of -225 to +225?

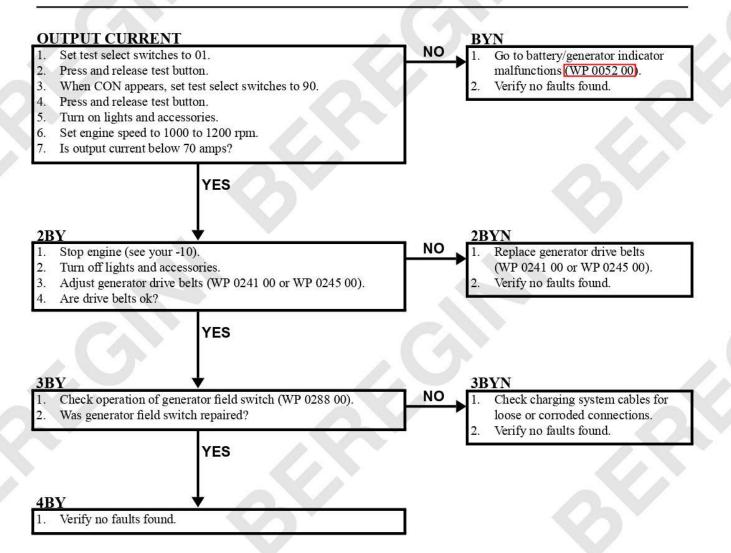
YES

- 1. Remove current probe from battery cable.
- 2. Start engine (see your -10).
- Install current probe around circuit 2 lead of generator.
- 4. Point arrow on current probe toward battery.

TN

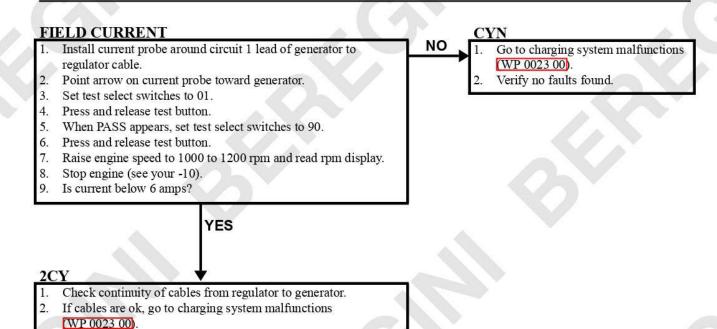
- Go to offset fault isolation. See TM 9-4910-571-12&P.
- Repeat this troubleshooting.

STE/ICE-R CHARGING CIRCUIT TROUBLESHOOTING—Continued



STE/ICE-R CHARGING CIRCUIT TROUBLESHOOTING—Continued

Verify no faults found.





STE/ICE-R STARTER CIRCUIT TROUBLESHOOTING

0109 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

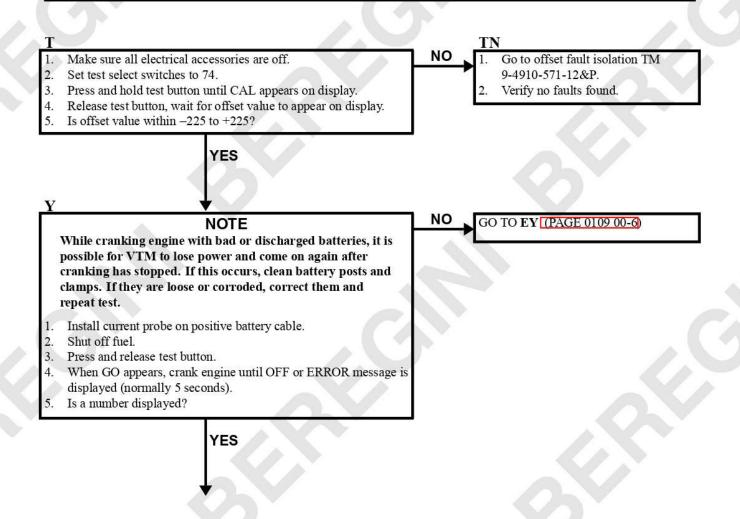
Unit Mechanic

References

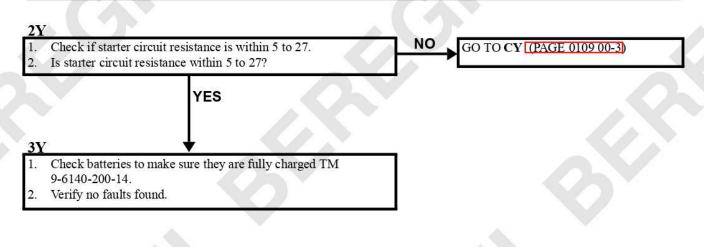
See your -10 TM 9-4910-571-12&P TM 9-6140-200-14 WP 0012 00 or WP 0013 00

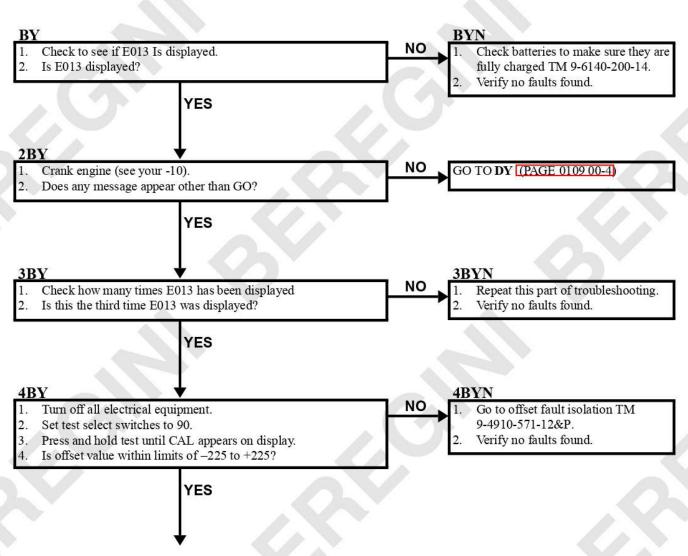
Equipment Condition

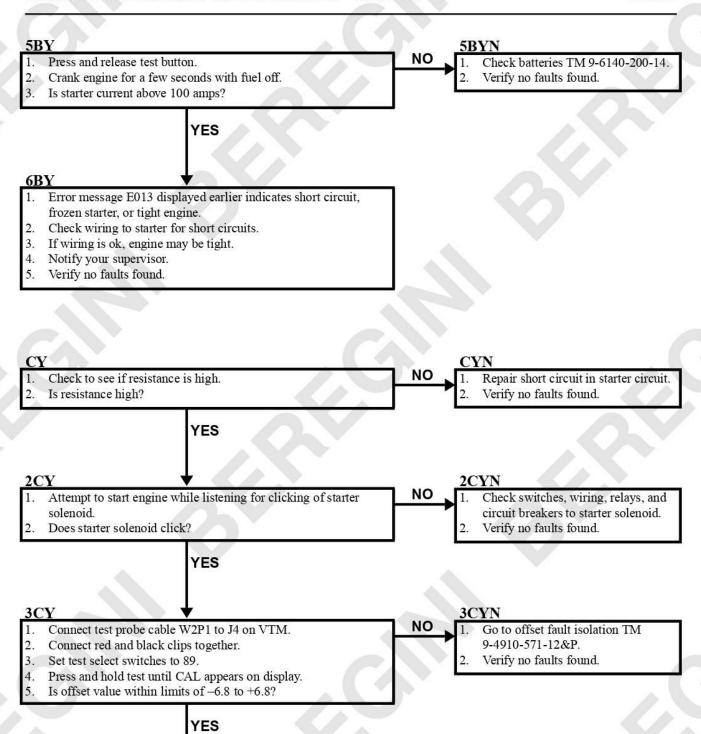
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10))
All electrical power off (see your -10)
STE/ICE-R hooked up for tests 72 thru 75 (WP 0117 00)
STE/ICE-R hooked up for power (WP 0114 00)



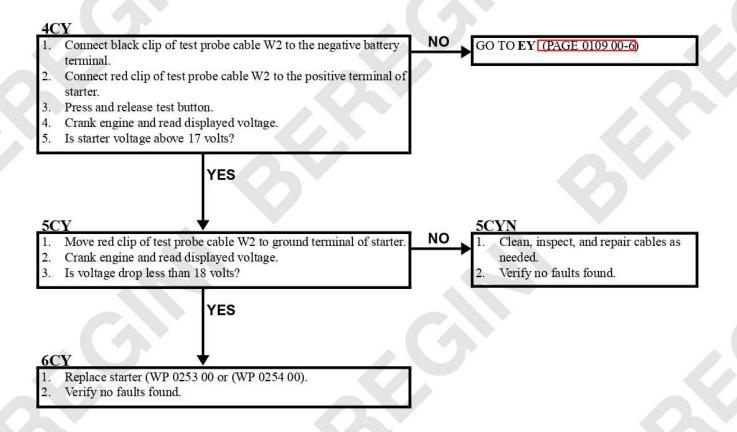
STE/ICE-R STARTER CIRCUIT TROUBLESHOOTING—Continued

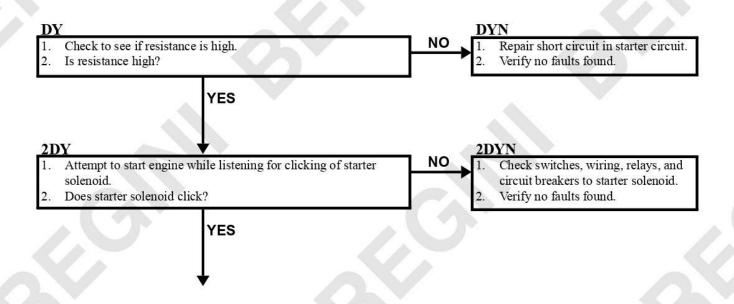




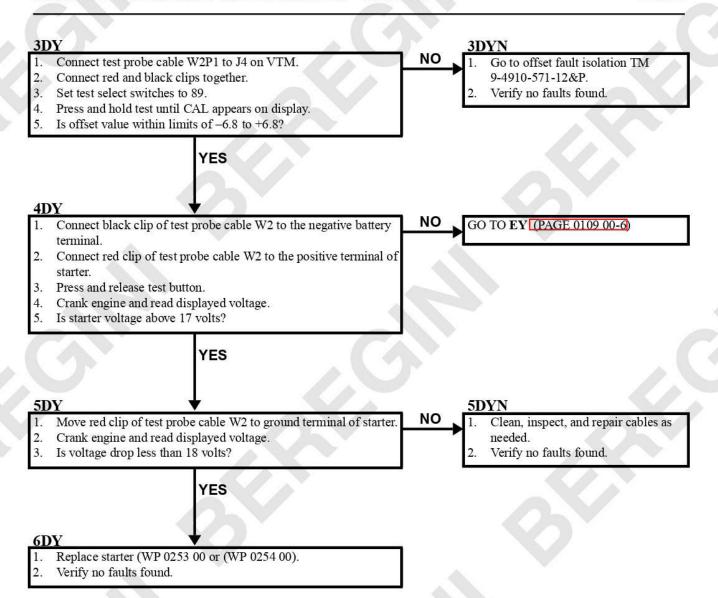


STE/ICE-R STARTER CIRCUIT TROUBLESHOOTING—Continued





STE/ICE-R STARTER CIRCUIT TROUBLESHOOTING—Continued



STE/ICE-R STARTER CIRCUIT TROUBLESHOOTING—Continued

010900

EY

- Move red clip of test probe cable W2 to positive terminal of starter solenoid.
- 2. Crank engine and read displayed voltage.
- 3. Is solenoid voltage above 18 volts?

YES

2EX

- If GO message occurred during starter circuit resistance test, check switches and wiring to solenoid.
- Voltage drop across a connection should be less than 0.1 volt and a voltage drop across a cable should be less than 0.2 volts. Check voltage drop across solenoid and all cables/connections in positive side if starter circuit.
- Set test select switches to 89.
- 4. Connect clip leads of test probe W2 across part to be measured.
- 5. Press and release test button.
- 6. Engage starter.
- 7. Repair part if voltage drop is high.
- 8. If switches and wiring to solenoid are ok, replace solenoid and starter (WP 0253 00 or WP 0254 00).
- 9. Verify no faults found.

FY

- Set test select switches to 67.
- 2. Press and release test button.
- 3. Crank engine and read displayed voltage?
- 4. Was battery voltage above 19 volts while cranking?

YES

2FY

- 1. Check switches and wiring to starter solenoid.
- Repair if necessary.
- Verify no faults found.

GO TO FY (PAGE 0109 00-6)

FYI

- Check batteries TM 9-6140-200-14.
- . Verify no faults found.

STE/ICE-R LOW OIL PRESSURE TROUBLESHOOTING

0110 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

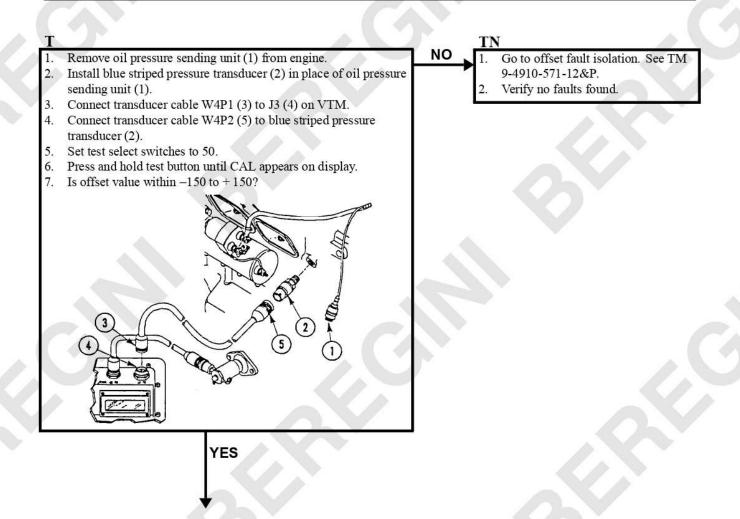
Unit Mechanic

References

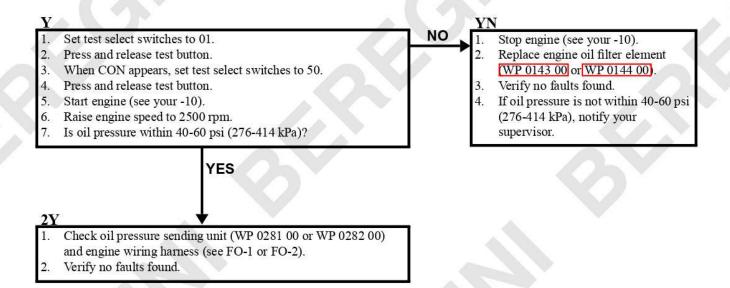
See your -10 TM 9-4910-571-12&P WP 0046 00

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
STE/ICE-R hooked up for power (WP 0114 00)
STE/ICE-R engine RPM test hooked up (WP 0115 00)



STE/ICE-R LOW OIL PRESSURE TROUBLESHOOTING—Continued



STE/ICE-R BATTERY TROUBLESHOOTING

0111 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

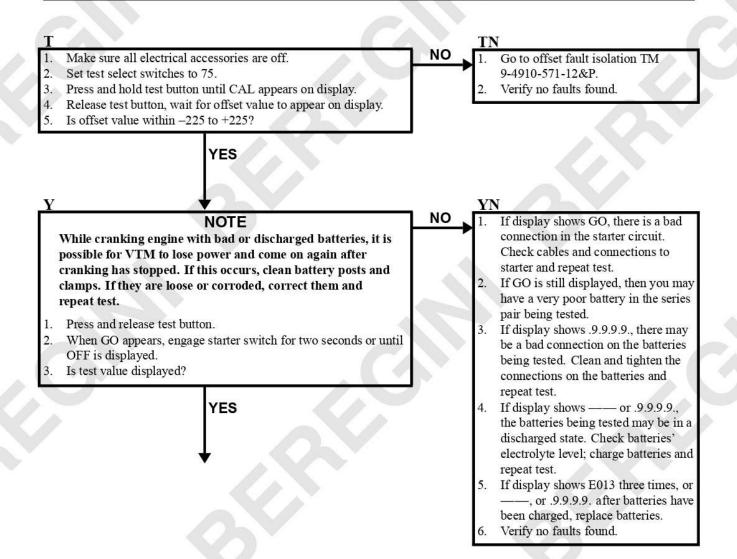
Unit Mechanic

References

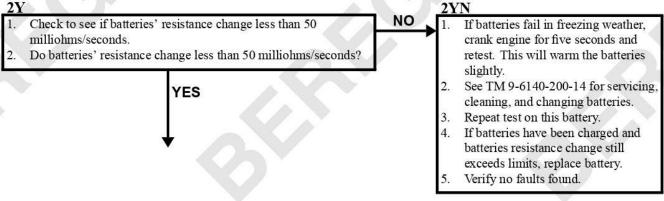
See your -10 TM 9-4910-571-12&P (WP 0052 00)

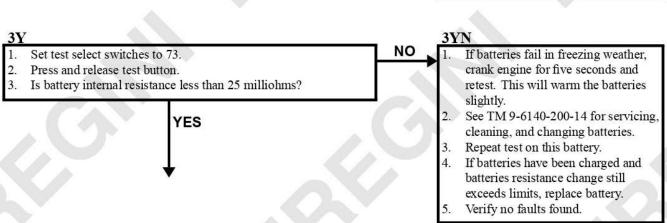
Equipment Condition

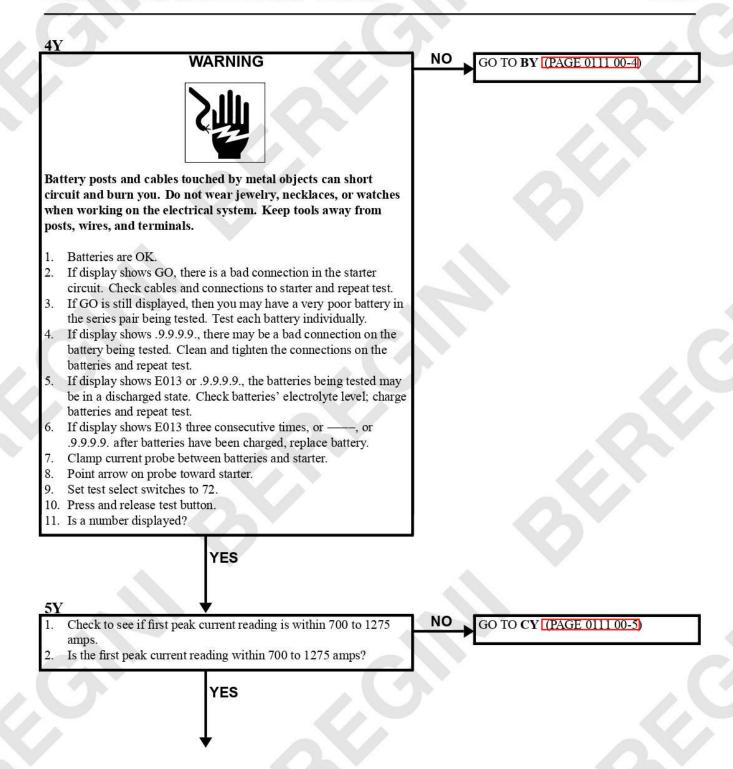
Engine stopped (see your -10)
Carrier blocked (see your -10)
Fuel off, engine must not start (see your -10)
All electrical power off (see your -10)
Driver's seat raised (see your -10)
STE/ICE-R starter circuit test hooked up (WP 0116 00)
STE/ICE-R power hooked up (WP 0114 00)



STE/ICE-R BATTERY TROUBLESHOOTING—Continued





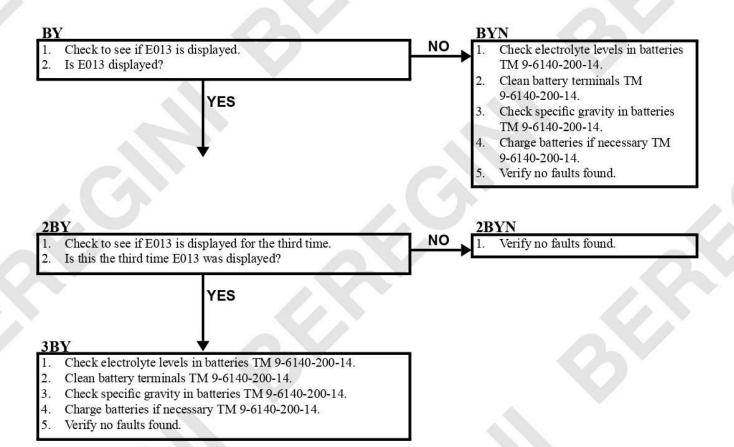


STE/ICE-R BATTERY TROUBLESHOOTING—Continued

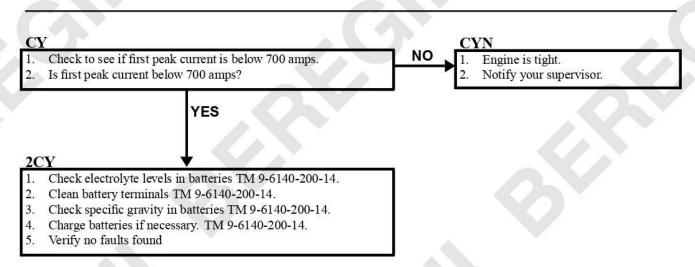
011100

6Y

- 1. Check electrolyte levels in batteries TM 9-6140-200-14.
- Clean battery terminals TM 9-6140-200-14.
- 3. Check specific gravity in batteries TM 9-6140-200-14.
- 4. Charge batteries if necessary TM 9-6140-200-14.
- Verify no faults found.



STE/ICE-R BATTERY TROUBLESHOOTING—Continued





STE/ICE-R ENGINE WILL NOT CRANK TROUBLESHOOTING

0112 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

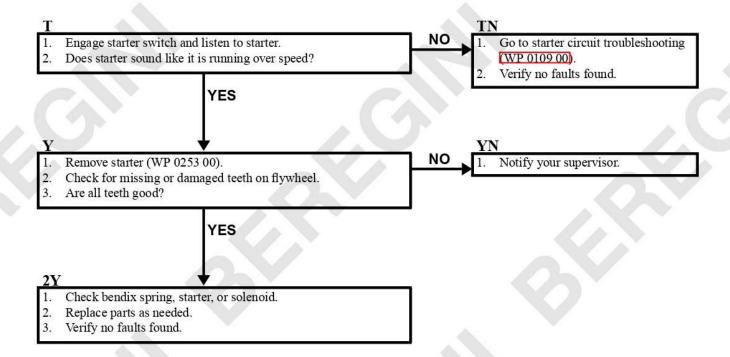
See your -10 (WP 0010 00)

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat raised (see your -10)





STE/ICE-R ENGINE WILL CRANK BUT WILL NOT START TROUBLESHOOTING

0113 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

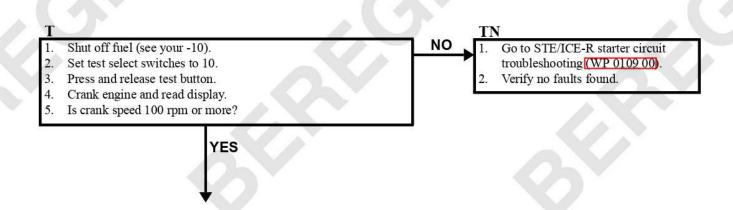
Unit Mechanic

References

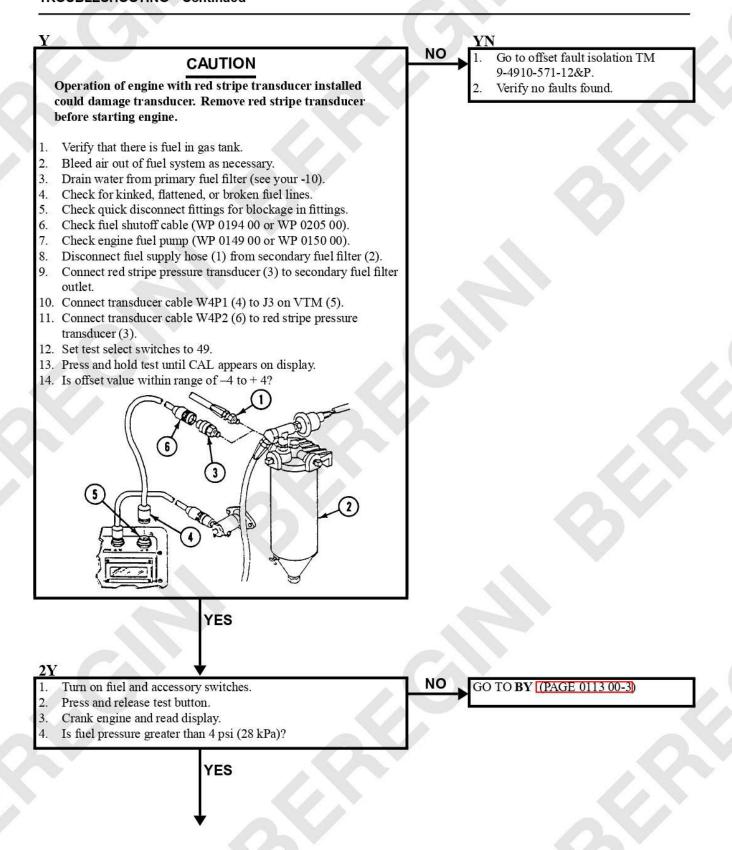
See your -10 TM 9-94910-571-12&P WP 0015 00

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R engine RPM test hooked up (WP 0119 00)



STE/ICE-R ENGINE WILL CRANK BUT WILL NOT START TROUBLESHOOTING—Continued



STE/ICE-R ENGINE WILL CRANK BUT WILL NOT START TROUBLESHOOTING—Continued

0113 00

3Y

- Remove red stripe pressure transducer from secondary fuel filter.
- 2. Check operation of engine shutoff cable (WP 0193 00).
- Check restriction in air intake (WP 0193 00).
- 4. Check cold weather operation (see your -10).
- 5. If engine still does not start, notify your supervisor.
- 6. Verify no faults found.

NO Remove red stripe pressure CAUTION transducer from secondary fuel filter. Pull fuel shutoff all the way out. Transducer will be Check engine fuel pump damaged if engine starts. (WP 0149 00 or WP 0150 00). Check generator field switch 1. Remove red stripe pressure transducer from secondary fuel filter. (WP 0288 00). 2. Connect fuel supply hose to secondary fuel filter. In freezing temperatures, check fuel Remove inlet plug (1) from secondary fuel filter (2) and install 3. lines for ice blockage or coagulation red stripe pressure transducer (3) in inlet hole (4) of filter. of fuel. Pull fuel shutoff all the way out. Start engine (see your -10). Crank engine and read display. If engine still does not start, repair Is fuel pressure greater than 4 psi (28 kPa)? blockage in fuel line. Verify no faults found. 3) YES

STE/ICE-R ENGINE WILL CRANK BUT WILL NOT START TROUBLESHOOTING—Continued

0113 00

2BY

- 1. Remove red striped pressure transducer and install plug in secondary fuel filter.
- Replace fuel filter element (WP 0178 00 or WP 0179 00). 2. 3.
- Start engine (see your -10).
- If engine still does not start, check fuel system (WP 0162 00 thru WP 0175 00).
- Verify no faults found.

HOOK UP/REMOVE STE/ICE-R FOR POWER

0114 00

THIS WORK PACKAGE COVERS:

Hookup (page 0114 00-1) Removal (page 0114 00-3)

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set

WP 0541 00, Item NSN-4910-01-222-6589

Personnel Required

Unit Mechanic

References

See your -10

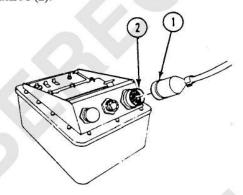
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10) Driver's seat raised (see your -10)

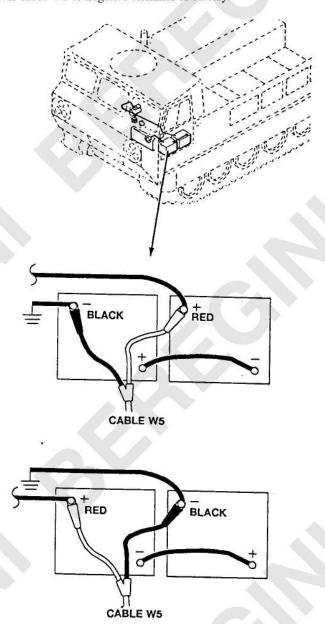
HOOK-UP

- 1. Remove VTM and power cable W5 from transit case.
- 2. Pull VTM circuit breaker to OFF.
- 3. Install plug W5P1 (1) on VTM jack J1 (2).



4. Connect red clip of power cable W5 to positive terminal of battery.

5. Connect black clip of power cable W5 to negative terminal of battery.



- 6. Push VTM circuit breaker to ON.
 - a. If display reads (8888) and (---), go to Step 8.
 - b. If display is not blank, but does not read (8888) and (---), write up DA form 2404 on faulty VTM display. Report problem to supervisor.
 - c. If display is blank, go to VTM blank display diagnostic troubleshooting see TM 9-4910-571-12&P.

NOTE

If VTM fails to display current readouts, refer to confidence test fault isolation (see TM 9-4910-571-12&P).

NOTE

Intermediate test results are displayed indicating test in progress. The end result will alternately show software revision number and the PASS message. The displayed software revision number has a month (one digit), year (two digits), and the version number (zero). The software revision flashing on the display should match the software revision number on the label located on the side of the VTM. If they are different, return the STE/ICE-R set to your supervisor.

- 7. Perform VTM confidence check:
 - Set test select switches to 66.
 - b. Press and release test button.
 - c. Wait for display to show 0066.
 - d. Set test switches to 99.
 - e. Press and release test button.
 - f. Wait for the alternate display of the revision number and PASS message. Go to Step 9
 - g. If PASS is not displayed, go to STE/ICE-R confidence test fault isolation (see TM 9-4910-571-12&P).
- 8. Select test 60, then press and release TEST button.
- 9. Enter carrier VID (03) into VTM, then press and release TEST button.
- Select test 61, then press and release TEST button. If carrier VID (03) does not appear on VTM display, (see TM 9-4910-571-12&P).
- 11. Return to troubleshooting that referred you to this task.

REMOVAL

- Pull VTM circuit breaker to OFF.
- 2. Remove power cable W5 from batteries and VTM. Use electrical connector pliers.
- 3. Stow VTM and power cable W5 in transit case.



HOOK UP/REMOVE STE/ICE-R FOR ENGINE RPM

0115 00

THIS WORK PACKAGE COVERS:

Hook-up (page 0115 00-1). Removal (page 0115 00-2).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

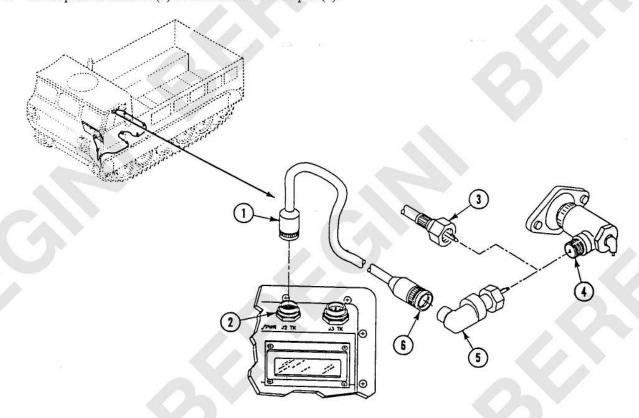
See your -10 TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Driver's seat raised (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
Power plant rear access door/panel removed (see your -10)

HOOK-UP

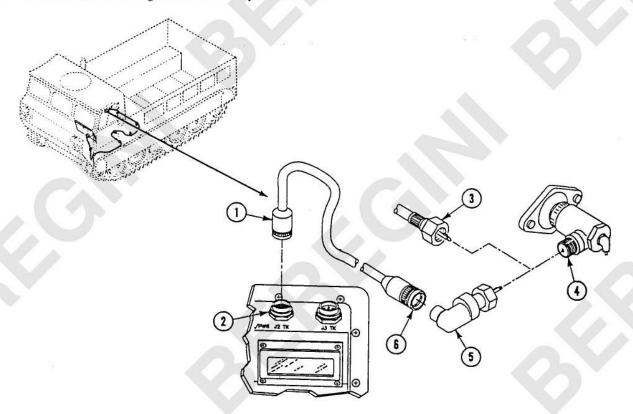
- 1. Remove transducer cable W4 and pulse tachometer from transit case.
- Pull VTM circuit breaker to OFF.
- 3. Connect cable W4P1 (1) to jack J2 TK (2) on VTM.
- 4. Disconnect tachometer cable (3) from tachometer drive adapter (4) on engine (WP 0520 00 or WP 0521 00).
- 5. Install pulse tachometer (5) on tachometer drive adapter (4).



CAUTION

To prevent cable damage, make sure cable is clear of belts and fan blade.

- 6. Connect cable W4P2 (6) to pulse tachometer (5).
- 7. Push VTM circuit breaker to ON.
- 8. Return to troubleshooting task that referred you to this task.



REMOVAL

- 1. Pull VTM circuit breaker to OFF.
- 2. Disconnect cable W4P2 from pulse tachometer.
- 3. Remove pulse tachometer from tachometer drive adapter.
- 4. Install tachometer cable on drive adapter (WP 0520 00 or WP 0521 00).
- 5. Remove cable W4P1 from jack J2 TK on VTM.
- 6. Stow transducer cable and pulse tachometer in transit case.

HOOK UP/REMOVE STE/ICE-R FOR STARTER CIRCUIT TESTS

0116 00

THIS WORK PACKAGE COVERS:

Hook-up (page 0116 00-1). Removal (page 0116 00-2).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10

TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)

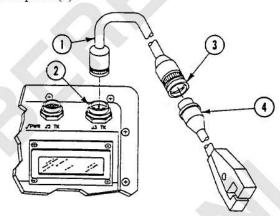
Carrier blocked (see your -10)

Center seat raised (see your -10)

STE/ICE-R power hooked up (WP 0114 00)

HOOK UP

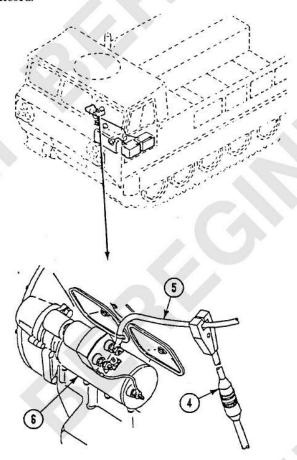
- 1. Remove transducer cable W4 from transit case.
- 2. Pull VTM circuit breaker to OFF.
- 3. Install cable W4P1 (1) on VTM jack J3 TK (2).
- 4. Attach cable W4P2 (3) to current probe (4).



NOTE

If current probe is below room temperature, wait at least 5 minutes after connecting probe to VTM before doing offset test, or perform offset within 30 seconds of starting each measurement.

5. Clamp current probe (4) around positive (+) battery cable (5) going to the starter (6). Point arrow on probe along cable to starter. Make sure probe is closed.



- Push VTM circuit breaker to ON.
 - If display reads (8888) and (---), go to Step 7.
 - b. If display is not blank, but does not read (8888) and (---), write up DA form 2404 on faulty VTM display. Report problem to supervisor.
 - c. If display is blank, go to VTM blank display diagnostic troubleshooting (See TM 9-4910-571-12&P).
- 7. Return to troubleshooting task that referred you to this task.

REMOVAL

- Pull VTM circuit breaker to OFF.
- 2. Remove transducer cable W4 from battery cable and VTM.
- 3. Disconnect cable W4P2 from current probe.
- 4. Stow transducer cable W4 and current probe in transit case.

HOOK UP/REMOVE STE/ICE-R TEST SET FOR TEST NUMBERS 72 THRU 75

0117 00

THIS WORK PACKAGE COVERS:

Hook-up (page 0117 00-1). Removal (page 0117 00-3).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat raised (see your -10)

All electrical accessories turned off (see your -10)

Engine at operating temperature (see your -10)

Fuel off, engine must not start (see your -10)

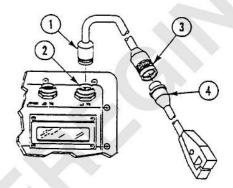
STE/ICE-R power hooked up (WP 0114 00)

HOOK-UP

NOTE

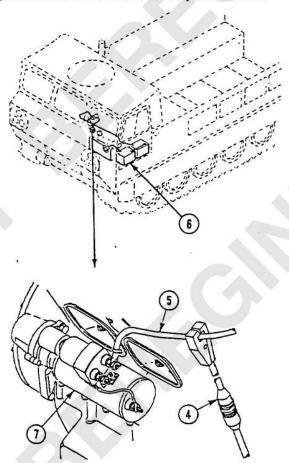
Do not have battery charger connected when performing test numbers 72 thru 75.

- 1. Remove transducer cable W4 and current probe from transit case.
- 2. Pull VTM circuit breaker to OFF.
- 3. Install cable W4P1 (1) on VTM jack J3 TK (2).
- 4. Attach cable W4P2 (3) to current probe (4).

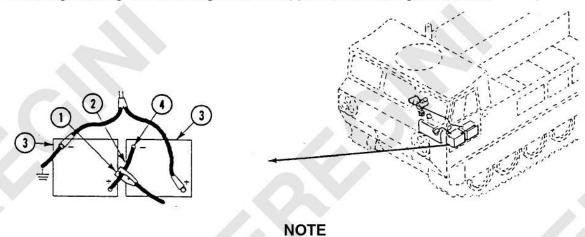


5. Push VTM circuit breaker to ON.

6. For test numbers 72 or 74, current probe (4) is connected to positive cable (5) between battery (6) and starter (7). Point arrow on current probe along cable to starter. Make sure current probe is closed.



7. For test numbers 73 or 75, clamp current probe (1) around cable (2) connecting series pair of batteries (3). Point arrow on current probe along cable toward negative terminal (4). Make sure current probe is closed.



Engine must not start while cranking engine. If engine starts, repeat Step 8.

8. Continue current probe by engaging starter only long enough to briefly turn engine (approximately 1 second).

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HOOK UP/REMOVE STE/ICE-R TEST SET FOR TEST NUMBERS 72 THRU 75—Continued

0117 00

9. Return to troubleshooting task that referred you to this task.

REMOVE

- 1. Pull VTM circuit breaker to OFF.
- 2. Remove cable W4P1 from VTM jack J3 TK.
- 3. Remove cable W4P2 from current probe.
- 4. Stow transducer cable W4 and current probe in transit case.



STE/ICE-R TEST 01 DISPLAY ENGINE RPM WITH NEXT MEASUREMENT

0118 00

THIS WORK PACKAGE COVERS:

Test (page 0118 00-1)

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10) Center seat raised (see your -10)

STE/ICE-R power hooked up (WP 0114 00)

STE/ICE-R engine RPM test hooked up (WP 0115 00)

- Select TEST 01.
- Press and release TEST button.
- 3. VTM will display CON.

NOTE

Hook up and offset steps should already have been completed. Do not repeat.

Go to desired measurement procedure. Follow that procedure. VTM will alternately display the engine speed and the desired measurement. The first number displayed will be RPM.

4. Return to troubleshooting task that referred you to this task.



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STE/ICE-R TEST 10 ENGINE RPM

0119 00

THIS WORK PACKAGE COVERS:

Test (page 0119 00-1)

INITIAL SETUP:

Maintenance Level References

Unit See your -10

TM 9-4910-571-12&P

Tools and Special Tools Equipment Condition

STE/ICE-R Test Set (WP 0541 00, Item 6) Engine stopped (see your -10)
Carrier blocked (see your -10)

Personnel Required STE/ICE-R power hooked up (WP 0114 00)

Unit Mechanic STE/ICE-R starter circuit test hooked up WP 0116 00

STE/ICE-R engine RPM test hooked up (WP 0115 00)

1. Select TEST 10.

Press and release TEST button.

NOTE

At speeds below 50 RPM, the VTM will display 0. At speeds above 5000 RPM, the display may give a false reading.

VTM will display engine RPM:

Table 1.

CONDITIONS ENGINE RPM
CRANKING 100 minimum
IDLE 650 – 700
GOVERNED SPEED (NO LOAD) 2975 – 3000

- a. If error message appears, see (WP 0107 00).
- b. If display is erratic or reads 0 with engine turning, see TM 9-4910-571-12&P.
- 4. Read cranking RPM while starting engine.
- 5. Check engine idle speed.
 - Watch VTM for 10 seconds.
 - b. If engine idle speed does not remain between 650 and 700 RPM, notify your supervisor.
- 6. Return to troubleshooting task that referred you to this task.



STE/ICE-R TEST 13 POWER (PERCENT)

0120 00

THIS WORK PACKAGE COVERS:

Test [page 0120 00-1]

INITIAL SETUP:

Maintenance Level

Unit

References
See your -10

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

STE/ICE-R power hooked up (WP 0114 00)

STE/ICE-R engine RPM test hooked up (WP 0115 00)

Warm engine to operating temperature (see your -10)

NOTE

If VID has been performed during power hook up procedure (WP 0114 00), go to Step 2 page 0120 00-0. If not, then continue to do Step 1 page 0120 00-0.

- Enter VID.
 - Set TEST SELECT switches to 60.
 - b. Press and release TEST button.
 - c. Wait for prompting message UEH to appear on display.
 - Set TEST SELECT switches to 03.
 - e. Press and release TEST button.
 - f. Wait for VTM to display and hold VID number.

NOTE

Engine idle speed must be checked before performing power test. If idle speed is not within limits specified for vehicle/equipment, adjust idle speed to be within proper limits.

Do not run power test if idle speed cannot be properly adjusted.

- 2. Start and idle engine.
 - a. Set TEST SELECT switches to 10.
 - b. Press and release TEST button.
 - c. Observe displayed value (rpm) and adjust idle speed if necessary.
 - d. Observe displayed value (rpm).

CAUTION

Engine governor speed must be checked before performing power test. If governor speed is not within limits specified for vehicle/equipment, notify your supervisor.

Do not run power test if governor speed is not within specified limits. Damage to engine may result.

To prevent damage to equipment, allow engine to idle for at least two minutes after running power test.

Perform power test.

STE/ICE-R TEST 13 POWER (PERCENT)—Continued

- a. Set TEST SELECT switches to 13.
- b. Press and release TEST button.
- c. When CIP is displayed, sharply depress accelerator. Hold it to the floor. When VTM displaysOFF, release accelerator.
- d. A number will be displayed after engine has returned to idle speed. This number is the test result in units of percent of nominal rated power.
- 4. Return to troubleshooting task that referred you to this task.

Table 1.

Vehicle M113/M548 FOV	Altitude		
	0 to 2000 feet	2000 feet to 4000 feet	Above 4000 feet
	75%	66%	60%

STE/ICE-R TEST 14 COMPRESSION UNBALANCE (POWER CABLE)

0121 00

THIS WORK PACKAGE COVERS:

Test (page 0121 00-1)

INITIAL SETUP:

Maintenance Level Equipment Condition

Unit Engine stopped (see your -10)
Carrier blocked (see your -10)

Tools and Special Tools

STE/ICE-R power hooked up (WP 0114 00)

STE/ICE-R Test Set (WP 0541 00, Item 6) Warm engine to operating temperature (see your -10)

Personnel Required Disengage transfer gearcase (see your -10)

 Unit Mechanic
 Run test 72
 WP 0123 00)

 References
 Run test 73
 WP 0124 00)

 References
 Run test 74
 WP 0125 00)

See your -10 Run test 75 WP 0124 00)

NOTE

If VID has been performed during power hook up procedure (WP 0114 00), go to Step 2 page 0121 00-0. If not, then continue to do Step 1 page 0121 00-0.

Enter VID.

- a. Set TEST SELECT switches to 60.
- b. Press and release TEST button.
- c. Wait for prompting message UEH to appear on display.
- d. Set TEST SELECT switches to 03 for vehicle being tested.
- e. Press and release TEST button.
- f. Wait for VTM to display and hold VID number.

NOTE

Do not run more than two compression unbalance tests in a row. Idle engine between pairs of compression unbalance tests.

Crank engine without fuel for 5 seconds to clear fuel from cylinders.

NOTE

If E013 appears, test data cannot be analyzed because of weak batteries or interrupted cranking during test. Correct problem and repeat Step 2 page 0121 00-0.

Perform test.

- a. Set TEST SELECT switches to 14.
- b. Press and release TEST button.
- c. When GO appears, crank engine. Display will change to (---) while engine is turning.
- d. When OFF or E013 appears, stop cranking. Wait for message to appear.

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STE/ICE-R TEST 14 COMPRESSION UNBALANCE (POWER CABLE)—Continued

- 1) If a number is displayed, refer to the vehicle test card for its meaning (WP 0107 00).
- If GO appears, go back to Step 2.c page 0121 00-0.
- 3) A FAIL message usually means compression is too far unbalanced to measure with STE/ICE-R. Occasionally, a FAIL message may be caused by carrier/equipment accessories that are activated during cranking or by imperfections in the starting system.

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STE/ICE-R TEST 67 BATTERY VOLTAGE

0122 00

THIS WORK PACKAGE COVERS:

Test page 0122 00-1

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10

TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

STE/ICE-R power hooked up (WP 0114 00)

STE/ICE-R starter circuit test hooked up (WP 0116 00)

STE/ICE-R engine rpm test hooked up (WP 0115 00)

1. Select TEST 67.

2. Press and release TEST button.

Table 1.

CONDITION

ENGINE OFF MASTER SWITCH OFF

CRANKING ENGINE FUEL OFF

CHARGING 1200 RPM SERVICE LIGHTS ON

VOLTS

22 or more

18 or more

- a. If display is erratic or shows 0 volts, see TM 9-4910-571-12&P.
- If error message appears, see (WP 0107 00).
- c. If .9.9.9.9 is displayed, voltage is not within test range. Use test 89, see TM 9-4910-571-12&P.
- Return to troubleshooting task that referred you to this task.



STE/ICE-R TEST 72 STARTER CURRENT (FIRST PEAK)

0123 00

THIS WORK PACKAGE COVERS:

Test page 0123 00-1

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10 TM 9-4910-571-12&P Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

All electrical accessories turned off (see your -10) Fuel OFF, engine must not start (see your -10)

STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)

- 1. Select TEST 72.
- 2. Perform offset test.
 - a. Press and hold TEST button until CAL appears. Release TEST button.
 - b. If VTM reads between -225 and +225, offset test passes.
 - c. If offset test fails, see TM 9-4910-571-12&P.
- 3. Press and release TEST button.
- 4. When GO appears, turn MASTER SWITCH ON and crank engine for 2 seconds or until one of the following appears on VTM:

Table 1.

DISPLAY PERFORM/RESULT

a. OFF Stop cranking and wait for message to appear.

b. A number CIRCUIT RESISTANCE (in amps)

c. .9.9.9.9 Beyand range of VTM, cannot be measured.

d. Error message See (WP 0107 00)

- Turn MASTER SWITCH OFF.
- Observe VTM reading.
 - a. If VTM reading is between 700 and 1275, test passes.
 - b. If reading is erratic or cannot be obtained, see TM 9-4910-571-12&P.
- 7. Return to troubleshooting task that referred you to this task.



STE/ICE-R TEST 73 BATTERY RESISTANCE — STE/ICE-R TEST 75 BATTERY RESISTANCE CHANGE (PACK)

0124 00

THIS WORK PACKAGE COVERS:

Test (page 0124 00-1)

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10 TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery cover removed (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)

WARNING



Battery posts and cables touched by metal objects can short circuit and burn you. Do not wear jewelry, necklaces, or watches when working on the electrical system. Keep tools away from posts, wires, and terminals.

- 1. Reposition current probe.
 - a. Pull VTM switch to OFF.
 - b. Remove current probe from positive battery cable.
 - c. Connect current probe to cable connecting series pair of batteries together.
 - d. Push VTM switch to ON.
 - e. Select TEST 73.

NOTE

Both TEST 73 and TEST 75 must be performed to determine condition of series pair of batteries.

- Perform offset test.
 - a. Press and hold TEST button until CAL appears. Release TEST button.
 - b. If VTM reads between -225 and +225, offset test passes.
 - c. If offset test fails, see TM 9-4910-571-12&P.

STE/ICE-R TEST 73 BATTERY RESISTANCE — STE/ICE-R TEST 75 BATTERY RESISTANCE CHANGE (PACK)—Continued

0124 00

- 3. Press and release TEST button.
- 4. When GO appears, crank engine for two seconds or until one of the following appears on display:

Table 1.

DISPLAY PERFORM/RESULT

a. OFF
Stop cranking and wait for message to appear.

b. A number CIRCUIT RESISTANCE (milliohms test 73; milliohms/

seconds test 75)

c. .9.9.9.9 Beyond range of VTM, cannot be measured.

d. Error message See (WP 0107 00)

(—)

VTM lost power during test.

Batteries may be too weak. Try
powering VTM using external
source.

Observe VTM reading.

- a. If test 73 VTM reading is 25 or less, test passes.
- b. If test 73 VTM reading is over 25, test fails.
- c. If test 75 VTM reading is 50 or less, test passes.
- d. If test 75 VTM reading is over 50, test fails.

Table 2.

TEST 73	TEST 75	
BATTERY INTERNAL RESISTANCE	BATTERY RESISTANCE CHANGE	BATTERY PACK CONDITION
TEST RESULT	TEST RESULT	
PASS	PASS	The batteries tested are ok and in good state of charge.
PASS	FAIL	The batteries tested are in poor condition, but have a fresh charge.
FAIL	PASS	The batteries tested are ok, but need to be recharged.
FAIL	FAIL	The batteries tested are in poor condition and in a state of discharge.

Select test 75.

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STE/ICE-R TEST 73 BATTERY RESISTANCE — STE/ICE-R TEST 75 BATTERY RESISTANCE CHANGE (PACK)—Continued

0124 00

- 7. Repeat Steps 2 page 0124 00-0 5 page 0124 00-0.
- 8. Determine condition of series pair of batteries using table.
 - a. If batteries are in poor condition, go to individual battery tests 77 and 79 (see TM 9-4910-571-12&P).
- 9. Return to troubleshooting task that referred you to this one.



STE/ICE-R TEST 74 STARTER CIRCUIT RESISTANCE

0125 00

THIS WORK PACKAGE COVERS:

Test [page 0125 00-1]

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10 TM 9-4910-571-12&P **Equipment Condition**

Engine stopped (see your -10) Carrier blocked (see your -10)

All electrical accessories turned off (see your -10)
Fuel OFF, engine must not start (see your -10)
STE/ICE-R power hooked up (WP 0114 00)

STE/ICE-R starter circuit test hooked up (WP 0116 00)

- 1. Select TEST 74.
- 2. Perform offset test.
 - a. Press and hold TEST button until CAL appears. Release TEST button.
 - b. If VTM reads between -225 and +225, offset test passes.
 - c. If offset test fails, see TM 9-4910-571-12&P.
- 3. Press and release TEST button.
- 4. When GO appears, turn MASTER SWITCH ON and crank engine for 5 seconds or until one of the following appears on VTM:

Table 1.

DISPLAY

a. OFF

Stop cranking and wait for message to appear.

b. A number

CIRCUIT RESISTANCE (in milliohms)

c. 9.9.9.9

Beyond range of VTM, cannot be measured.

d. Error message

See WP 0107 00

- Turn MASTER SWITCH OFF.
- Observe VTM reading.
 - a. If VTM reading is between 5 and 27, test passes.
 - b. If reading is erratic or cannot be obtained, see TM 9-4910-571-12&P.
- 7. Return to troubleshooting task that referred you to this one.



STE/ICE-R TEST 90 DC CURRENT 0 TO 1500 AMP

0126 00

THIS WORK PACKAGE COVERS:

Test [page 0126 00-1]

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10 TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)

NOTE

If current probe is below room temperature, wait at least 5 minutes after connecting probe to VTM before doing offset test, or perform offset within 30 seconds of starting each measurement.

- Perform offset test.
 - a. Set TEST select switches to 90.
 - b. Push and hold TEST button until CAL appears. Release TEST button.
 - c. If VTM reads between -225 and +225, offset test passes.
 - If offset test fails, see TM 9-4910-571-12&P.
- 2. Press and release TEST button
- 3. Turn on circuit used to condition current probe. If starter is used to condition probe, energize starter long enough to obtain a reading. Do not allow engine to start.
- 4. Note polarity sign of conditioning current. If readout is negative (-), reverse current probe, and repeat Steps 1 page 0126 00-0 4 page 0126 00-0.
- 5. Turn off circuit used to condition current probe.
- Perform offset test.

NOTE

Stray magnetic fields can affect the current reading. Such fields may exist within a foot or so of operating carrier generators and alternators, motor generators under load, and electric motors. Keep current probe at least one foot away from any operating generators, alternators, or electric motors.

- 7. During offset test, the component being tested must be off, and the circuit must be de-energized.
 - a. Turn off component to be tested.
 - b. Install current probe where current is to be measured.

STE/ICE-R TEST 90 DC CURRENT 0 TO 1500 AMP—Continued

0126 00

- c. Push and hold TEST button until CAL appears. Release TEST button.
- d. If VTM reads between -225 and +225, offset test passes.
- e. If offset test fails, see TM 9-4910-571-12&P.
- 8. Press and release TEST button.
- Turn on component to be tested.

NOTE

If .9.9.9.9 appears on display, the test current is greater than 1500 amp and cannot be measured with STE/ICE-R.

If display reads a value with a minus sign, current probe has been installed backwards. Repeat Steps 1 page 0126 00-0 - 5 page 0126 00-0. Be careful not to reinstall current probe backwards.

- 10. Observe VTM reading.
 - a. If VTM reads between 250 and 425 amp, test passes.
 - b. If reading is erratic or cannot be obtained, see TM 9-4910-571-12&P.
- 11. Turn off component in Step 9 page 0126 00-0.
- 12. Return to troubleshooting task that referred you to this one.

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CHAPTER 3

UNIT MAINTENANCE INSTRUCTIONS FOR PMCS INCLUDING LUBRICATION INSTRUCTIONS

WORK PACKAGE INDEX	
Title	Sequence No.
SERVICE UPON RECEIPT OF MATERIEL	0127 00
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS	
MULTIPLE PIN AND SOCKET IDENTIFICATION	0129 00



SERVICE UPON RECEIPT OF MATERIEL

0127 00

THIS WORK PACKAGE COVERS:

This section tells you how to service your carrier when it is first received from a depot. It also gives information on administrative storage.

INITIAL SETUP:

Maintenance Level

Unit

GENERAL INSTRUCTIONS

If you find anything wrong during this preliminary check and service, or during break-in period, report them to your supervisor. These deficiencies must be corrected before carrier can be placed in service.

You are required to report any serious problems which appear to involve unsatisfactory design or material. Prepare the Equipment Improvement Recommendations (EIR) using SF-369, Quality Deficiencies Report, as stated in DA PAM 738-750.

PRELIMINARY CHECKS AND ADJUSTMENTS

DEPROCESSING CARRIER

1. All new or reconditioned carriers, when first received by using soldiers, must be deprocessed. Unit Mechanics must decide if carrier has been properly prepared for service. The carrier must be in condition to perform its assigned mission.

The carrier crew will assist in the performance of these checks and services.

Remove rust preventive coatings from all exterior services. Use cleaning compound (WP 0542 00, Item 9).

Read DD Form 1397 (Processing and Deprocessing record for Shipment, Storage, and Issue of Vehicles and Spare Engines). Follow precautions checked on the form. Form should be in a waterproof cover attached to one of the headlights. A duplicate copy should be in the driver's compartment.

Read and follow instructions on all warning tags attached to engine, radiator filler neck, and driver's compartment.

Follow procedures given in the Preventive Maintenance Checks and Services (WP 0128 00).

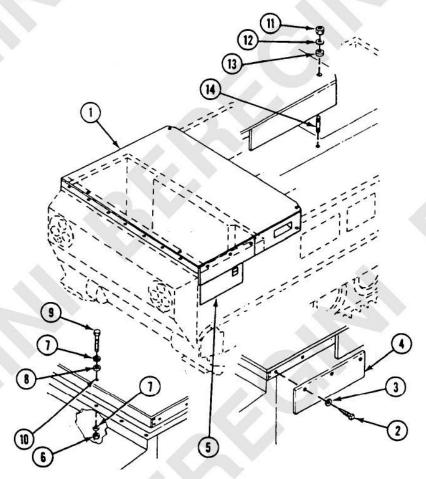
M548A1 AND M548A3 DEPROCESSING PROCEDURES

NOTE

The shipping closure and attaching hardware are reusable items. Do not damage. Keep attaching hardware with closure. Refer to your supervisor for disposition of these items.

One access panel is installed on each side of cab.

- 1. Remove shipping closure (1).
 - a. Remove six lag bolts (2), washers (3), and two side access panels (4) from two cab doors (5). Open cab doors.
 - b. Remove two nuts (6), four washers (7), two washers (8), screws (9), and front of shipping closure (1) from two windshield mounting holes (10).
 - c. Remove two nuts (11), washers (12), washers (13), and rear of shipping closure (1) from two studs (14). Lift shipping closure from carrier.
 - d. Before storage of shipping closure (1), install two side access panels on shipping closure with six washers (3) and lag bolts (2).



Remove equipment packages from driver's cab. Packages contain windshield wiper blades and arms with attaching nuts, exhaust pipe, and two hooks and pintle.

- 3. Remove equipment packages from cargo compartment. Packages contain cab cover, windshield, side door windows, on vehicle equipment (OVE), cargo cover, and, if so equipped, vehicle compartment heater kit defroster duct, machine gun mount kit, and material handling (hoist) kit.
- 4. Remove tape seals from exhaust outlet and engine air intake, oil filler cap, and oil dipstick.
- Install air cleaner hose on engine air intake (WP 0153 00 or WP 0159 00).
- 6. Check tension on drive belts for generator (WP 0241 00 or WP 0245 00), fan and coolant pump (WP 0252 00).
- 7. Unpack batteries. Add electrolyte to batteries TM 9-6140-200-14 to 3/8 inch (9 mm) above bottom plates (about 2 gallons (8 liters) each). Install two batteries for M548A1 (WP 0290 00) and four batteries for M548A3 (WP 0293 00) in carrier battery compartment.
- Unpack windshield and side door windows. Install windshield on carrier (WP 0392 00). Install side door windows on driver's cab doors (WP 0387 00).
- 9. Unpack windshield wiper blades and arms with attaching nuts. Install blades and arms on carrier (WP 0422 00).
- 10. Unpack exhaust pipe. Install pipe on exhaust muffler outlet (WP 0209 00 or WP 0210 00).
- 11. Remove tape and paper wrappings from seat cushions and backrests.
- 12. Remove wire cloth screens from access and drain openings in hull. Install drain plugs, float valves, drain covers, and hull bottom access cover (WP 0383 00).
- Unpack cab cover, left and right side frames, and rear crossbow. Install cover, frames, and crossbow on carrier (WP 0418 00).
- Unpack and inventory basic issue items (BII) (see your -10). Record any missing or damaged items and stow BII on carrier.
- If equipped (M548A1), unpack vehicle compartment heater kit defroster duct. Install defroster duct in carrier (WP 0432 00).
- If equipped (M548A1), unpack machine gun mount kit. Install gun mount on carrier (WP 0513 00, WP 0514 00, or WP 0515 00).
- 17. Unpack towing hooks. Install hooks on towing eyes (WP 0376 00).
- 18. Unpack towing pintle. Install pintle on carrier tailgate (WP 0377 00).
- 19. Unpack cargo covers and bows. Install them over cargo compartment (WP 0417 00).
- 20. If equipped (M548A1), unpack material handling kit. Install hoist kit in cargo compartment (WP 0482 00).
- 21. Remove preservative coating from outer moving parts on winch (M548A1). Use cleaning compound (WP 0542 00, Item 9).
- 22. Clean pivot steering brake disks. Use cleaning compound (WP 0542 00, Item 9).
- 23. Perform Before PMCS (see your -10).
- 24. Check operation of all controls (see your -10).
- 25. Perform complete lube (WP 0128 00).
- 26. Start and run engine (see your -10). Check for oil leaks. Disregard smoky exhaust for first few minutes of operating. Some rust preventive fuel will be in the system when engine is started. It will burn along with the regular fuel.

WARNING



Do not handle wire rope with bare hands. Broken wires can rip your hands open. Wear leather gloves when handling wire rope.

- 27. Unreel winch cable (M548A1) (see your -10). Remove preservative coating from cable with cleaning compound (WP 0542 00, Item 9). Coat cable with preservative lubricating oil (WP 0542 00, Item 15). Rewind cables on drums.
- 28. Check pivot steering brakes (M548A1).
 - a. Place transmission range selector lever in 1-2 range.
 - b. Release differential brakes.
 - c. Slowly press accelerator pedal until carrier reaches speed of 3 mph (5 km/h).
 - d. Release accelerator pedal and pull back on both left and right steering levers evenly and firmly until carrier comes to a complete stop.

WARNING



Do not handle wire rope with bare hands. Broken wires can rip your hands open. Wear leather gloves when handling wire rope.

- Unreel shelter puller winch cable (M548A1) (see your -10). Remove preservative coating from cable with cleaning compound (WP 0542 00, Item 9). Coat cable with preservative lubricating oil (WP 0542 00, Item 15). Rewind cables on drums.
- 30. Check operation of all controls (see your -10).

M548A1/M548A3 CALIBER .50 MACHINE GUN MOUNT KIT DEPROCESSING PROCEDURES

- General procedures:
 - a. Check material to make sure it is ready for use. Clean, lube as needed, and prepare material for service.
 - b. List missing or damaged parts and any malfunctions.
 - c. Report serious problems on DA Form 2404.
- 2. Specific procedures:
 - a. Unpackage and inventory machine gun mount kit parts against packing list and TM 9-1010-231-13&P.
 - b. Assemble ring mount TM 9-1010-231-13&P.
 - c. Install supports and ring mount (WP 0514 00).
 - d. Install pintle and cradle (WP 0515 00).

0127 00-4

- e. Lube ring mount (WP 0128 00).
- f. Perform Before PMCS (see your -10).

M548A1/M548A3 M66 RING MOUNT KIT DEPROCESSING PROCEDURES

General procedures:

- a. Check material to make sure it is ready for use. Clean, lube as needed, and prepare material for service.
- b. List missing or damaged parts and any malfunctions.
- c. Report serious problems on DA Form 2404.

2. Specific procedures:

- Unpackage and inventory gun mount kit parts against packing list and TM 9-1010-231-13&P.
- b. Assemble ring mount TM 9-1010-231-13&P.
- c. Install supports and ring mount (WP 0514 00).
- d. Install deflector support and cartridge deflector (WP 0514 00).
- e. Install machine gun mount TM 9-1010-231-13&P.
- f. Lube gun mount (WP 0128 00).
- g. Perform Before PMCS (see your -10).

M548A1/M548A3 7.62 MM MACHINE GUN MOUNT KIT DEPROCESSING PROCEDURES

General procedures:

- a. Check material to make sure it is ready for use. Clean, lube as needed, and prepare material for service.
- b. List missing or damaged parts and any malfunctions.
- c. Report serious problems on DA Form 2404.

2. Specific procedures:

- a. Unpackage and inventory machine gun mount kit parts against packing list and RPSTL.
- b. Install M66 gun mount kit (WP 0514 00). Omit deflector and tripod brackets.
- Install 7.62 mm gun mount (WP 0515 00).
- d. Perform Before PMCS (see your -10).
- e. Perform After PMCS (see your -10).

M548A1/M548A3 MATERIAL HANDLING KIT DEPROCESSING PROCEDURES

1. General procedures:

- a. Check material to make sure it is ready for use. Clean and prepare material for service.
- List missing or damaged parts and any malfunctions. Correct deficiencies.
- Report serious deficiencies which appear to involve unsatisfactory design or material on SF-368, Quality Deficiencies Report.

Specific procedures:

a. Unpack and inventory material handling kit parts against packing list and RPSTL.

SERVICE UPON RECEIPT OF MATERIEL — Continued

012700

M548A1/M548A3 TURN SIGNAL KIT DEPROCESSING PROCEDURES

- 1. General procedures:
 - a. Check material to make sure it is ready for use. Clean and prepare material for service.
 - b. List missing or damaged parts and any malfunctions. Correct deficiencies.
 - Report serious deficiencies which appear to involve unsatisfactory design or material on SF-368, Quality Deficiencies Report.
- 2. Specific procedures:
 - a. Check that all parts are properly assembled and installed.
 - b. Test operation of turn signal (WP 0505 00).

ADMINISTRATIVE STORAGE

1. Instructions for administrative storage of your carrier are contained in ATPD 2228.

END OF TASK

0128 00

THIS WORK PACKAGE COVERS:

Semi-Annual (page 0128 00-20).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

Adapter (WP 0541 00, Item 3) Adapter (WP 0541 00, Item 3A) Torque Wrench (WP 0541 00, Item 68) Torque Wrench (WP 0541 00, Item 69) Torque Wrench (WP 0541 00, Item 70) Torque Wrench (WP 0541 00, Item 71)

Torque Wrench (WP 0541 00, Item 71)
Torque Wrench (WP 0541 00, Item 72)

Materials/Parts

Automotive (GAA) grease (WP 0542 00, Item 14)

Brush (WP 0542 00, Item 30)

Cleaning cloth (WP 0542 00, Item 8)

Cleaning compound (WP 0542 00, Item 9)

Engine lubricating oil (WP 0542 00, Item 13)

General purpose detergent (WP 0542 00, Item 16)

Hydraulic fluid (FRH) (WP 0542 00, Item 18)

Sealing tape (WP 0542 00, Item 25)

Wiping rag (WP 0542 00, Item 45)

Personnel Required

Unit Mechanic

References

DA Pamphlet 738-750

DA Form 2404 DD Form 314 FM 10-16 TB 43-0106 TB 43-0209

TM 9-214

TM 3-6680-316-10

TM 9-2350-247-10

TM 9-6140-200-14

TM 9-2350-247-24&P

TM 9-2540-205-24&P

TM 9-2540-207-14&P

Equipment Condition

Engine stopped (see your -10)

SCOPE

This section details preventive maintenance checks and services (PMCS) and lubrication procedures required for the M548A1 and M548A3 Carriers at the unit maintenance level. For crew level PMCS, see your -10.

MAINTENANCE FORMS AND RECORDS

The forms and records you fill out have many uses. They are a permanent record of the service, repairs, and changes made to your vehicle. They also tell you whether faults have been repaired. For information on forms and records, see DA Pamphlet 738-750.

WARNINGS AND CAUTIONS

Always observe the WARNINGS and CAUTIONS appearing in the PMCS tables BEFORE, DURING, and AFTER you operate the equipment. The WARNINGS and CAUTIONS appear before certain procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or prevent your equipment from being damaged.

0128 00

PMCS PROCEDURES

CAUTION

Water in engine exhaust system and heater exhaust will cause serious damage. Keep water out of engine exhaust system by either running the engine or taping over the exhaust outlet. Tightly cover heater exhaust wells.

Obey all WARNINGS and CAUTIONS when you do PMCS.

Name, caution, and instruction plates should be easy to read. If they are dirty or corroded, clean them, and coat them with lacquer. See TM 43-0139 for instructions.

If something doesn't work, troubleshoot it using the troubleshooting procedures (WP 0005 00).

Do the Semi-annual PMCS every 1500 miles (2414 km) of operation or 150 hours, whichever comes first, after the last Semi-annual PMCS. Complete forms DA Form 2404 and DD Form 314.

Always do your PMCS in the same order so it gets to be a habit. With practice, you'll spot anything that is wrong.

Keep your carrier clean. Dirt, grease, oil, and debris only get in the way, and may cover up a serious problem. Clean your vehicle as you work and as needed.

After operation in water, mud, or loose sand, clean and lube carrier as soon as possible. Do not wait for next scheduled PMCS. Use cleaning compound(WP 0542 00, Item 9) on metal surfaces. Use general purpose detergent (WP 0542 00, Item 16) and water when you clean rubber or plastic parts.

You need to know how fluid leaks affect your vehicle. Definitions of the types and classes of leaks are given in General Maintenance Instructions below. You need to know them to determine the condition of your vehicle. Learn them. REMEMBER: WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

NOTE

The carrier may continue to operate with minor water or oil leaks (Class I or II). You must consider how much fluid the item or system being checked or inspected can hold. When in doubt, notify your supervisor. Any Class III leaks or any fuel leaks will make the carrier NOT READY/AVAILABLE.

CLASS I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

CLASS II Leakage of fluid great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.

CLASS III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

GENERAL MAINTENANCE INSTRUCTIONS

SCOPE

This section contains safety warnings, guidelines, and general maintenance instructions such as cleaning, inspection and repair. They should be followed when doing maintenance procedures. These instructions only apply to procedures authorized at unit maintenance level.

1. PREPARATION FOR MAINTENANCE

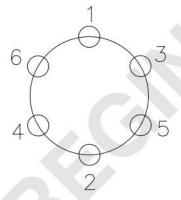
- a. PERSONNEL SAFETY. Practice all shop safety procedures and read all warnings in this manual.
- b. *PROPER EQUIPMENT*. Get tools and equipment before starting a maintenance task. See RPSTL (TM 9-2350-247-24&P), and the maintenance task for tools, equipment, parts, and materials.
- c. WHAT TO DISCARD. Parts to discard, such as lock washers, lock nuts, and gaskets, are listed in the maintenance tasks. If the step does not say to discard a part, the part should be saved. It may be used later or repaired.
- d. HANDLING TECHNIQUES.

0128 00

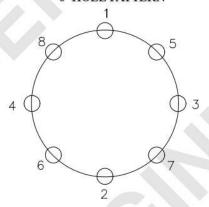
- Avoid damage to parts during removal, cleaning, inspection, repair, and installation procedures. Nicks, scratches, and dents caused by careless handling could result in equipment failure.
- Dirt can damage parts and cause malfunctions. Make sure all air and fluid openings, lines, and hoses are capped or plugged during maintenance procedures.

e. IDENTIFICATION.

- 1) During removal, tag parts to ensure proper installation.
- 2) During removal, tag leads on electrical parts to ensure proper installation. Tag each lead as it is removed.
- f. TORQUING. Where needed, torque values are listed in the maintenance task. When torquing, use one of the star pattern sequences below unless otherwise stated in the maintenance task.

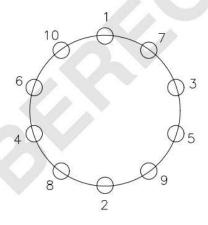


6-HOLE PATTERN

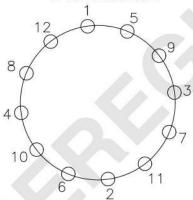


8-HOLE PATTERN

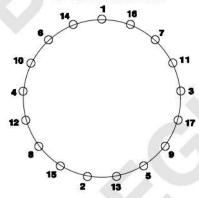
0128 00



10-HOLE PATTERN



12-HOLE PATTERN

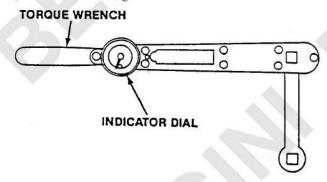


17-HOLE PATTERN

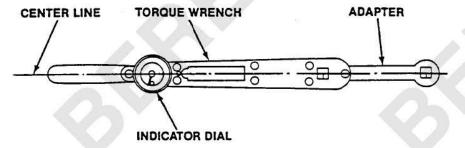
- g. USE OF TORQUE WRENCH ADAPTERS AND THE CONVERSION FORMULA.
 - The torque values given in the text of this manual are the actual values that must be applied to the nut or screw for proper maintenance.

0128 00

- Some tasks require the use of a torque wrench adapter when the nut or screw cannot be reached with a regular socket on the end of the torque wrench. When an adapter is used on a torque wrench, definite rules must be followed or the nut or screw will be over- or under-torqued. The center line of the adapter should be used in one of two positions:
 - a) One position is to have the adapter center line at right angles to the center line of the torque wrench. In this position, the indicator reading does not have to be calculated and it may be read direct.



b) The other position is to have the center line of the adapter in line with the center line of the torque wrench. In this case, the adapter adds to the overall length of the torque wrench and makes the dial or scale reading less than the actual torque applied to the nut or screw. To prevent overtorquing and damage to equipment, you must calculate a corrected dial or scale reading.

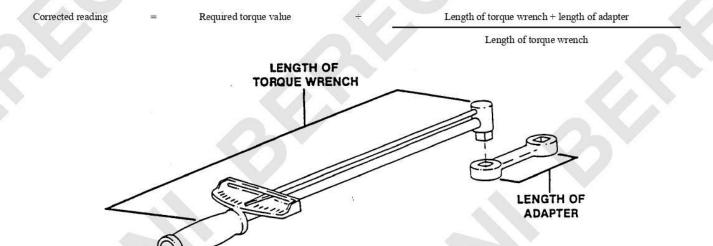


3) To determine the corrected scale or dial reading, use the following formula and refer to the example.

NOTE

The length of the torque wrench is measured from the center of the handle to the center of the drive. The length of the adapter is measured from the center of the drive to the center of the wrench.

0128 00



In the following example, the torque wrench measured 12 inches (30 cm) and the adapter measured 3 inches (8 cm). From step (4), the required torque is 104 lb-ft (141 N·m).

4) Replace mission track tension adjuster mount screws (1). TIGHTEN LOOSE SCREWS TO 130-140 LB-FT (176-190 N·M) TORQUE. Use adapter (WP 0541 00, Item 2) and torque wrench (WP 0541 00, Item 3).

Use 3 inch adapter.

Use 1/2 inch drive torque wrench.

To determine the corrected reading for this task, use the formula:

Corrected reading	=	Required torque value	*	Length of torque wrench + length of adapter
Corrected reading	_<	130 lb-ft	-	Length of torque wrench 12 inches + 3 inches
Corrected reading	_	130 lb-ft	ē .	12 inches 15 inches
				12 inches
Corrected reading	=	130 lb-ft	÷	1.25
Corrected reading	=	104 lb-ft		

Repeat above steps for other value.

2. CLEANING

a. GENERAL. Cleaning is very important. All parts must be cleaned well and kept clean during maintenance. Dirt or foreign matter can cause malfunctions and equipment failure. General cleaning procedures are detailed in steps b through n. Special cleaning procedures are covered in the task relating to the specific part.

0128 00

- 1) Inspect and cap all air and fluid openings, lines, and hoses.
- b. CLEAN EVERY PART. Clean every part well after removal and before installation. Clean parts such as housings, covers, and dipsticks before removal. Avoid getting dirt and foreign matter in a system.
 - 1) Clean all parts before inspection, after repair, and before installation. Use cleaning compound or approved cleaner. Dry parts with wiping rag (WP 0542 00, Item 45).
- c. *HANDLE WITH CARE*. Use care when handling parts during cleaning and maintenance. Nicks, scratches, dents, or burrs can prevent proper assembly or cause malfunctions after assembly.
 - 1) Keep hands free of grease; grease collects dirt.
 - 2) After cleaning, cover or wrap parts to protect from dirt.
- d. AVOID ABRASIVES. Except where specially called for in a task, don't use abrasives, files, wire brushes, or sharp tools. On some surfaces, finish is important to the operation of close-fitting parts.
- e. *REMOVAL AGENTS*. Remove gum or old grease deposits by soaking parts in cleaning compound (WP 0542 00, Item 9). Scrub with a brush (WP 0542 00, Item 30) Use cleaning cloth (WP 0542 00, Item 8) to remove minor surface defects.



Air under pressure in excess of 30 psi (207 kpa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

CAUTION

Lye or caustic mixtures will damage metal surfaces. Do not use lye or caustic mixtures to clean metal surfaces.

- f. STEAM CLEANING. If steam cleaning is used, dry clean parts at once with compressed air. Apply a thin film of clean oil to surfaces that are not painted to prevent rusting. Never use lye or caustic mixtures that will corrode or etch metal surfaces.
- g. LUBRICATION OF NEW BEARINGS. See TM 9-214 for cleaning and lubrication procedures. Bearings that have been in service should also be lubricated.
- h. CASTINGS.



Air pressure in excess of 30 psi (207 kpa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

0128 00-7

0128 00

- Clean inner and outer surfaces of casting with cleaning compound (WP 0542 00, Item 9). Dry casting with compressed air.
- 2) Remove sludge and gum deposits with brush (WP 0542 00, Item 30).
- 3) Blow out all tapped holes with compressed air.
- BEARINGS. Bearings require special cleaning techniques. See TM 9-214 for cleaning and maintenance procedures for bearings.
- j. BATTERIES. See TM 9-6140-200-14 to service batteries.
- k. OIL PASSAGES.
 - 1) Make sure oil passages are not clogged.
 - 2) Clean oil passages and break up any sludge or gum deposits.

WARNING



Air pressure in excess of 30 psi (207 kpa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- 2) Flush oil passages with cleaning compound (WP 0542 00, Item 9). Dry parts with compressed air.
- 1. OIL SEALS, ELECTRIC CABLES, AND FLEXIBLE HOSES.

CAUTION

Cleaning compound causes leather, rubber, and synthetic materials to become brittle. Do not use cleaning compound to clean seals, cables, and flexible hoses.

 Clean seals, cables, and flexible hoses with general purpose detergent (WP 0542 00, Item 16) and water. Dry with wiping rag (WP 0542 00, Item 45).

WARNING



Air pressure in excess of 30 psi (207 kpa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- m. INSERTS. Blow out insert holes with compressed air.
- n. *GASKETS*. If a gasket is being removed, scrape old gasket material and sealant off mating surface. Clean mating surface with cleaning compound (WP 0542 00, Item 9). Dry with wiping rag (WP 0542 00, Item 45).

3. INSPECTION

All removed parts must be inspected with care. Replace parts if damage or wear exceeds allowable limits.

0128 00

- a. *GENERAL*. Procedures for inspection will be the same for most parts. General inspection procedures are given in steps b through q below. Special inspection procedures are covered in the task as needed.
- b. CASTINGS.
 - Inspect all castings and forgings for breaks, cracks, and wear or scoring that would impair function.
 - Inspect machined surfaces for nicks, burrs, and raised metal. Mark damaged areas for repair.
 - Use straightedge to check all mounting flanges on housings and supports for bends. Inspect mating flanges for stains which would indicate oil leakage.
 - 4) Inspect all threaded parts for damaged or stripped threads.
- c. BEARINGS. Inspect bearings for free and smooth rotation, and broken or missing rollers. Also look for tightness of fit in bearing bores. Inspect bearing races for wear and color changes due to heat. See TM 9-214 for inspection procedures.
- d. STUDS. Inspect all studs for stripped or damaged threads, bent or loose condition, and signs of stretching.
- GEARS. Inspect gears for burs, wear, cracked or broken teeth, and pitting at tooth contact areas.
- f. BUSHINGS AND BUSHING-TYPE BEARINGS.
 - Check all bushings and bushing-type bearings for secure fit in casting. Check for color changes which could mean overheating. Inspect for size, scoring, out-of-roundness, burs, sharp edges, and signs of seizing.
 - 2) Check for dirt in oil holes and in bushing-type bearings. Oil holes and grooves must be clean and not damaged.
- g. OIL SEALS.
 - 1) Inspect feather edge of oil seals for tears, fraying, hardening, and cracking.
 - 2) Replace metal-covered oil seals when there are signs of damage or oil leakage.
- h. CORE HOLE PLUGS. Inspect core hole plugs for signs of leakage. Replace damaged core hole plugs.
- INSERTS.
 - 1) Inspect inserts for cracks and stripped or damaged threads.
 - 2) Check inserts for loose fit.
- j. GREASE SEALS, PREFORMED PACKINGS, AND GASKETS.

0128 00

- Inspect seals that are composition—type, rings, and preformed packings for wear, brittleness, cracks, cuts, and damage.
- 2) Inspect lip seals for cracks, wear, cuts, and brittleness. Inspect springs and seal shells for damage.
- Gaskets and seals on electrical parts may be reused. Inspect gaskets and seals for wear, nicks, cuts, and torn or missing gasket material. Replace gasket, if needed.
- k. SPLINED PARTS. Inspect splined parts for burrs, wear, twisted, cracked, or broken splines.
- 1. THREADED PARTS. Inspect all threaded parts for burrs and stripped or damaged threads.
- m. RETAINING RINGS. Inspect retaining rings for nicks, burrs, defects, loss of tension, and wear.
- n. SPRINGS. Inspect springs visually for wear, defects, breaks, and loss of tension or compression.
- o. SHAFTS AND SPINDLES. Inspect shafts and spindles for excessive wear, binding, scores, cracks, and burrs.
- p. ELECTRICAL PARTS.
 - 1) Inspect electrical parts before you install them. Look for mildewed, corroded, or burned parts.
 - Inspect electrical parts for pinched or loose wires and for cracked or broken wires, circuit cards, relays, and connectors.
 - 3) Inspect insulation and heatshrink tubing for cracks, tears, burns, or missing material.
- q. CANVAS COVERS AND ROPES.
 - 1) Inspect canvas covers and webbing for holes, cuts, seam tears, and mildew.
 - Inspect ropes and webbing for broken strands. If more than half the strands are broken, replace rope or webbing.

4. REPAIR

- a. *GENERAL*. General repair procedures are given in steps b through l below. Special procedures are covered in the task. After procedures, clean all parts well.
- b. CASTINGS.
 - Replace all cracked or broken castings.
 - 2) Repair minor damage to machined surfaces of castings with cleaning cloth (WP 0542 00, Item 8). Replace any part with defects that cannot be corrected or which will impair function.
- c. Repair minor surface bends by working bent surface of casting across sheet of crocus cloth on surface plate. Replace bent castings which would impair assembly or function.
- d. BEARINGS. See TM 9-214 for inspection and maintenance of needle roller or ball bearings.
- e. BUSHINGS AND BUSHING-TYPE BEARINGS. Replace bushings and bushing-type bearings if they are loose, scored, or have color change due to heat. When you replace bushings and bushing-type bearings, check nearby parts for damage or wear.
- f. OIL SEALS. Oil seals must be replaced when thin feather edge is damaged or when seal material is brittle.
 - 1) Press damaged oil seal from casting. Be careful not to damage bore.
 - When oil seal bore is damaged so an oil-tight seal is impossible, replace casting or adapter. Remove slight nicks, burs, and scratches with cleaning cloth (WP 0542 00, Item 8) dipped in cleaning compound (WP 0542 00, Item 9).
 - 3) Install new oil seal in casting bore or adapter using suitable oil seal replacement tool.

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- g. GREASE SEALS, PREFORMED PACKINGS, GROMMETS, AND GASKETS. Preformed packings, seals, grommets, and gaskets should be replaced when removed unless otherwise stated in the maintenance task. They should not be reused.
- h. THREADED PARTS. Replace all parts that have stripped or damaged threads. Replace parts that cannot be repaired by chasing threads with a used tap or die.
- RETAINING RINGS.
 - Retaining rings that have defects should be replaced when removed unless otherwise stated in the maintenance task. They should not be reused.
 - Some retaining rings are beveled on one side. When installing this type of ring, the beveled side must face the part to be retained.
- SPRINGS. Discard springs that have defects. Load and height inspection data, where needed, are given in maintenance procedures.
- k. SHAFTS AND SPINDLES.
 - 1) Replace shafts and spindles that show signs of wear, binding, scores, cracks, burrs, or clogged oil passages.



Air pressure in excess of 30 psi (207 kpa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- 2) Remove obstructions with compressed air or by probing with soft wire.
- 3) Remove burrs and minor surface defects with a cleaning cloth (WP 0542 00, Item 8).
- ELECTRICAL PARTS.
 - 1) Replace corroded or burned parts and parts which show sings of mildew.
 - 2) Tighten loose connections.
 - 3) Replace cracked or broken wires, circuit cards, relays, and connectors.
 - 4) Replace cracked, torn, or burned insulation and heatshrink tubing.
- m. CANVAS COVERS AND ROPES.
 - 1) Repair canvas cover tears and ripped seams. See FM 10-16 for canvas and webbing repair.
 - Repair rope and faulty rope ends with twine or adhesive tape. Trim rope ends. Reverse rope that shows minor wear.

5. FLUID LEAKS AND CHECKING FOR LEAKS

a. GENERAL. Fluid leaks in hoses and fluid lines affect the carrier parts operation. The types and classes of leaks are given below.

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PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued

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CLASS I Fluid seepage is not great enough to form drops, but it is shown

by wetness or color changes.

CLASS II Fluid leakage is great enough to form drops. Drops do not drip

from the item being checked or inspected.

CLASS III Fluid leakage is great enough to form drops that fall from the

item being checked or inspected

NOTE

You are allowed to operate equipment with minor water or oil leaks (Class I or II). You must consider how much fluid the item or system being checked or inspected can hold. When in doubt, notify your supervisor. Any fuel or Class III leaks will make the vehicle NOT READY/AVAILABLE.

- b. CHECKING FOR LEAKS AFTER A MAINTENANCE TASK. After doing maintenance on a part which involves hoses or fluid lines, check for leaks. If leaks occur after you have done a replace or repair task, find the source of the leak. Correct the problem. Follow these procedures.
 - 1) Do visual inspections to find the source of the leak.
 - a) Check for cracks on housing or cover.
 - b) Check that screws and any connections are not loose or overtight.
 - 2) If you cannot see the source of the leak, check the items listed below.
 - a) Check that preformed gasket is not bent, or pinched.
 - b) Check machined surfaces for fit and cleanliness.
 - c) If leak persists, notify supervisor.
- c. CHECKING FOR LEAKS USING CHALK TEST. Following replacement, repair, or adjustment of a door, access panel, or rubber seal, check for leaks by performing a chalk test. Use the following procedure:
 - 1) Use chalk or chalk powder to coat area around seal.
 - 2) Close door or panel.
 - Open door or panel.
 - 4) Check for unbroken chalk line on mating surface. Where chalk does not stick to mating surface, there is a leak in the seal surface.
 - 5) If a leak is found, perform adjustment to correct the problem.

6. WARM-UP ENGINE (M548A1)

To warm up the engine for a maintenance or troubleshooting task, do the following:

- a. Cover air inlet grill.
- b. Start engine (see your -10).
- c. Lock left and right steering levers.
- d. Move gear selector to 2-3 range. Do not release left and right steering levers.
- e. Raise engine speed to 1500 rpm until normal operating temperature is reached.
- f. Lower engine rpm to idle.
- g. Move gear selector to NEUTRAL.
- h. Stop engine (see your -10).

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i. Uncover air inlet grill.

7. WARM-UP ENGINE (M548A3)

To warm up the engine for a maintenance or troubleshooting task, do the following:

- Cover air inlet grill.
- b. Start engine (see your -10).
- Apply parking brake and foot brake.
- Move gear selector to 2-3 range.
- e. Run engine at approximately 800 rpm for 3 to 5 minutes, or until normal operating temperature is reached.
- f. Lower engine rpm to idle.
- g. Move gear selector to SL.
- h. Stop engine (see your -10).
- i. Uncover air inlet grill.

EXPLANATION OF PMCS TABLE ENTRIES

- (1) **Item Number Column** Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do the checks and services for the intervals listed.
- (2) **Interval Column** This column tells you how often you must perform the checks/services. Semi-Annual checks/services must be performed every six months or after 1500 (2400 km) of operation.
- (3) Man-Hour Column This column gives the man-hours (to the nearest 10th of an hour) needed to complete the prescribed lubrication service. This column is used only for lubrication services.
- (4) Item To Be Checked or Serviced Column This column lists the item to be checked or serviced.
- (5) **Crewmember/Procedure Column** This column gives the procedure you must do to check or service the item listed in the *Item To Be Checked or Serviced* column to know if the equipment is ready or available for its intended mission or for operation. You must do the procedure at the time stated in the interval column.
- (6) Equipment Not Ready/Available If: Column Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you perform check and service procedures that show faults as listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

ARMY OIL ANALYSIS PROGRAM (AOAP)

NOTE

Park carrier on level ground to check oil levels. Clean fittings with cleaning compound. Dry before lubricating. Check/lubricate all oil and grease fitting points after washing or fording.

AOAP is an effective maintenance diagnostic tool and not a maintenance substitute. TB 43-0106 must not be interpreted to mean that AOAP minimizes in any way the need to employ good maintenance practices and strong maintenance discipline.

SAMPLING REQUIREMENTS

Samples may be taken without warming a component to operating temperature if the equipment has been operated within the last 30 days. If the equipment has not been operated within the last 30 days, these requisites apply to both routine and special sampling. Several hours of operation are needed to completely mix old and new oils.

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SAMPLING PROCEDURES

Perform AFTER operation checks and services.

NOTE

DO NOT ADD OIL immediately prior to taking oil samples. When AFTER operation checks and services indicate the need to replenish oil levels, WAIT until after taking samples. New oil added immediately prior to taking samples will adversely effect oil analysis results.

Obtain two sample bottles (NSN 8125-01-082-9697) and two DA Form 2026 from the unit AOAP monitor.

Start engine (see your -10). If required (see Sampling Requirements above), drive carrier (see your -10) to bring engine and transmission up to normal operating temperatures.

Stop carrier and set the brakes (see your -10).

Place range selector in the N (Neutral) position and keep engine running. On M548A3, lock the steering wheel (see your -10). Raise crew seat and center floor plate (see your -10).

With engine operating, remove dust caps from the engine and transmission oil sampling valves.

Open sample valve on engine oil filter and drain a small amount of oil into a container to clear valve of grit and contamination. (Properly dispose of container and oil upon completion of sample taking.) Fill sampling bottle to the neck shoulder and seal it. Attach DA Form 2026 to sampling bottle.



Close oil sample valve and install dust cap.

Take oil sample from transmission in the same manner (see previous three steps).

Stop engine (see your -10).

Lower crew seat and center floor plate (see your -10).

Deliver sample bottles to the unit AOAP monitor.

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NOTE

For location of nearest AOAP Laboratory and complete information about AOAP, refer to TB 43-0106. "Oil filters shall be serviced/cleaned/changed as applicable, when: (a) They are known to be contaminated, or clogged; (b) Service is recommended by AOAP Laboratory analysis, or (c) At prescribed hard time intervals."

LUBRICATION TABLES

Lubrication intervals will be indicated by one of the following symbols:

OC = AOAP On-Condition

B = Before

D = Daily

AF = After

W = Weekly

M = Monthly

S = 1,500 miles (2,400 km), Semi-annually

AN = Annually

The following tables are used during PMCS lubrication checks.

Table 1. LUBRICATION SYMBOLS

SYMBOL	NOMENCLATURE	SPECIFICATION
FRH	Hydraulic Fluid, Rust Inhibited, Fire Resistant	MIL-PRF-46170C
GAA	Grease, Automotive and Artillery	MIL-PRF-10924G
OE/HDO	Lubricating Oil, Internal Combustion Engine	MIL-PRF-2104G
OEA	Lubricating Oil, Internal Combustion Engine	MIL-PRF-46167C
PE	Preservation Oil	MIL-PRF-21260E

Table 2. LUBRICANT USAGE: ENGINE

COMPONENTS	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
INTERVALS = AF, OC		+5 F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)	
OE/HDO (MIL- PRF-2104G) or OEA (MIL-PRF-46167C)	18 qt.	OE/HDO-15/40	OEA	
PE (MIL-PRF-21260E)		PE 30-1		
* For Arctic Operation Re	efer to FM 9-207	V .		

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Table 3. LUBRICANT USAGE: ENGINE

COMPONENTS	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
INTERVALS = D, S, OC	CAPACITY (APPROX)	Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL- PRF-2104D) or OEA (MIL-PRF-46167C)	18 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA

Table 4. LUBRICANT USAGE: TRANSMISSION

COMPONENTS REFILL		LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
INTERVALS = AF, S, AN, OC	CAPACITY (APPROX)	+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)	
OE/HDO (MIL- PRF-2104D) or OEA (MIL-PRF-46167C)	40 qt. or 10 gal.	OE/HDO-15/40	OEA	
PE (MIL-PRF-21260E)	See Note	PE 30-1		

NOTE: If transmission has been filled with preservation oil (MIL-PRF-21260E) by the manufacturer or at time of overhaul, leave this oil in transmission until first scheduled oil change. Maintain operating oil level by adding same grade of PE oil. When first scheduled oil change is made, refill transmission with applicable grade oil (OE/HDO or OEA).

Table 5. LUBRICANT USAGE: TRANSMISSION

COMPONENTS INTERVALS = AF, S, OC REFILL CAPACITY (APPROX)		LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL- PRF-2104D) or OEA (MIL-PRF-46167C)	16 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA

^{*} For Arctic Operation Refer to FM 9-207

Table 6. LUBRICANT USAGE: TRANSFER GEARCASE

COMPONENTS	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *			
INTERVALS = AF, S, OC	CAPACITY (APPROX)	Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)	
OE/HDO (MIL- PRF-2104D) or OEA (MIL-PRF-46167C)	2.5 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA	

Table 7. LUBRICANT USAGE: DIFFERENTIAL

COMPONENTS	REFILL		IS TO USE AT EXPECTED IMPERATURES *	
INTERVALS = AF, S, OC	CAPACITY (APPROX)	Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL- PRF-2104D) or OEA (MIL-PRF-46167C)	20 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA

Table 8. LUBRICANT USAGE: FINAL DRIVES

COMPONENTS INTERVALS = D, S, OC	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
	CAPACITY (APPROX)	Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL- PRF-2104D) or OEA (MIL-PRF-46167C)	3.5 qt. or 7 pt.	OE/HDO-15/40	OE/HDO-15/40	OEA

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Table 9. LUBRICANT USAGE: TACHOMETER AND SPEEDOMETER

COMPONENTS	REFILL LUBRICANTS TO USE AT EXTEMPERATURES *		
INTERVALS = AN, S	CAPACITY (APPROX)	+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GIA (MIL-G-23827B)	As Required	All Temperatures	
GAA (MIL-PRF- 10924G)	As Required		
OE/HDO (MIL- PRF-2104D) or OEA (MIL-PRF-46167C)	As Required		
* For Arctic Operation R	efer to FM 9-207		

Table 10. LUBRICANT USAGE: FAN GEAR BOX

COMPONENTS INTERVALS= M, S	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
	CAPACITY (APPROX)	+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)	
OE/HDO (MIL-PRF- 2104D)	0.75 pt.	OE/HDO-15/40	OEA	
* For Arctic Operation R	efer to FM 9-207			

Table 11. LUBRICANT USAGE: PULLEY SUPPORT ARM

COMPONENTS INTERVALS = M, S	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
	CAPACITY (APPROX)	+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GAA (MIL-PRF- 10924G)	As Required	All Temperatu	res
* For Arctic Operation Re	efer to FM 9-207		

Table 12. LUBRICANT USAGE: STEERING CONTROL BEARINGS; FOOT BRAKE PEDAL LINKAGE

COMPONENTS INTERVALS = S	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
	(APPROX)	+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GAA (MIL-PRF- 10924G)	As Required	All Temperati	ures
* For Arctic Operation F	Refer to FM 9-207		

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Table 13. LUBRICANT USAGE: PIVOT STEER SYSTEM

F +40°F to -10°F	0°F to -65°F
(+5°C to -23°C)	(-18°C to -54°C)
All Temperatures	
	All Temperatures

Table 14. LUBRICANT USAGE: FAN DRIVE SHAFT; STEERING CONTROL LEVER

COMPONENTS INTERVALS = S	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
	CAPACITY (APPROX)	Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
GAA (MIL-PRF- 10924G)	As Required	7)	All Temperatures	
* For Arctic Operation F	Refer to FM 9-207			

Table 15. LUBRICANT USAGE: UNIVERSAL JOINT

COMPONENTS INTERVALS= S	REFILL	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
	(APPROX)	+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GAA (MIL-PRF- 10924G)	As Required	All Temperat	ures
* For Arctic Operation F	Refer to FM 9-207		

Table 16. Semi-Annual Unit Level Preventive Maintenance Checks and Services for M458A1 and M458A3

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Semi- Annual		Road Test		
				NOTE	
				Be sure that all operator level PMCS in your -10 have been completed prior to performing unit level PMCS.	
				a. Perform a road test. Drive carrier at least 5 miles (8 km).	
				NOTE	
	5			When conditions prevent a road test, perform engine idle and governed no-load test (Step 88a) and (Step 89a).	
				b. Check instruments, gauges, and warning lights for normal indications as outline in your -10.	
		3	A.V	CAUTION	
				Do not allow engine to operate for prolonged periods if outside air temperature is less than 85 degrees F (29 degrees C) and gauge is above 200 degrees F (93 degrees C), or outside air temperature is above 85 degrees F (29 degrees C) and gauge is above 225 degrees F (107 degrees C). Serious damage to engine may result.	
a	Semi- Annual	i i	Left and Right Steering		
				CAUTION	
>				Power plant can be damaged. Do not pivot steer when carrier is moving except in a track failure emergency.	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		0		a. Check steering in left and right turns. If carrier does not finish a complete turn when wheel is turned to left or right, troubleshoot steering system (WP 0006 00).	Carrier does not turn properly.
b	Semi- Annual		Steering in Forward and Reverse Range	a. Check steering wheel in forward range and reverse range. If carrier does not make a complete turn after steering wheel is turned to the left and right, troubleshoot steering system (WP 0006 00).	Binding, grabbing, unusual noise, vibration, or carrier fails to turn.
·	Semi- Annual		Carrier Braking	a. Check carrier braking. If carrier does not slow down or stop when brakes are slightly or fully depressed, troubleshoot brake system (WP 0006 00).	Carrier fails to stop.
d	Semi- Annual		Carrier Shifting in All Ranges	a. Check shifting of carrier in all ranges. If carrier does not respond properly to selected driving range, troubleshoot gear selection system (WP 0006 00).	Carrier fails to shift into selected range.
e	Semi- Annual	X	Shutdown		
				CAUTION Turbo may be damaged by shutting down engine if engine is immediately stopped after periods of operation. Allow engine to run at idle speed (600-650 rpm) for 3 to 5 minutes before stopping. a. When shutting down engine: b. Check operation of fuel cutoff control.	
2	Semi- Annual		After Road Test		

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				Failure to set parking brake and block road wheels can allow carrier to move and could result in injury or death. Always set parking brake and block road wheels before working on carrier. a. Immediately after road test cautiously feel all wheel and idler hub for noticeable difference in temperature between hubs. An overheated hub indicates that bearing is out of adjustment, poorly lubricated, or damaged. b. Check temperature of shock absorbers. Shock absorbers should be warm. A cold shock absorber is faulty. c. Visually check inside and outside of carrier for fuel, oil, or hydraulic leaks.	Any Class III leaks, cold shocks, or bad bearings.
3	Semi- Annual		Idle Test	CAUTION Avoid lengthy engine idling. This causes coolant temperature to drop below operating temperature and can shorten engine life.	
				a. Run engine at 800 rpm for 3-5 minutes with range selector in 2 to 3 range and brakes locked until normal operating temperature is reached.	Engine runs hot or rough.

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/
			SERVICED		AVAILABLE IF:
				b. If outside temperature is less than 85 degrees F (29 degrees C), normal operating temperature should be 160 degrees F to 200 degrees F (71 degrees to 93 degrees C). If outside air temperature is greater than 85 degrees F (29 degrees C), normal operating temperature should be 160 degrees to 225 degrees F (71 degrees to 107 degrees C).	
				c. With range selector in N (M548A1) or SL (M548A3), engine should idle smoothly at 650 to 700 rpm.	
3			,	d. High or low engine idle speed is usually caused by accelerator linkage being out of adjustment. Adjust linkage if necessary (WP 0197 00 or WP 0200 00).	
				e. Rough idling is usually caused by faulty injector timing and rack setting, faulty injectors or air in the injection system. Notify your supervisor.	
4	Semi- Annual	0.2	Transmission Oil	a. Sample transmission oil. Use procedures given in TB 43-0106. For lubricant information, see Table 4, page 0128 00-16 or Table 5, page 0128 00-16	Hard time interval exceeded, AOAP recommends change.
5	Semi- Annual	0.2	Engine Oil	a. Sample engine oil. Use procedures given in TB 43-0106. For lubricant information, see Table 3, page 0128 00-16	Hard time interval exceeded, AOAP recommends change.
6	Semi- Annual	0.2	Final Drive Oil	a. Check left and right final drive oil level. Use procedures given in TB 43-0106. For lubricant information, see Table 8, page 0128 00-17	Hard time interval exceeded, AOAP recommends change.

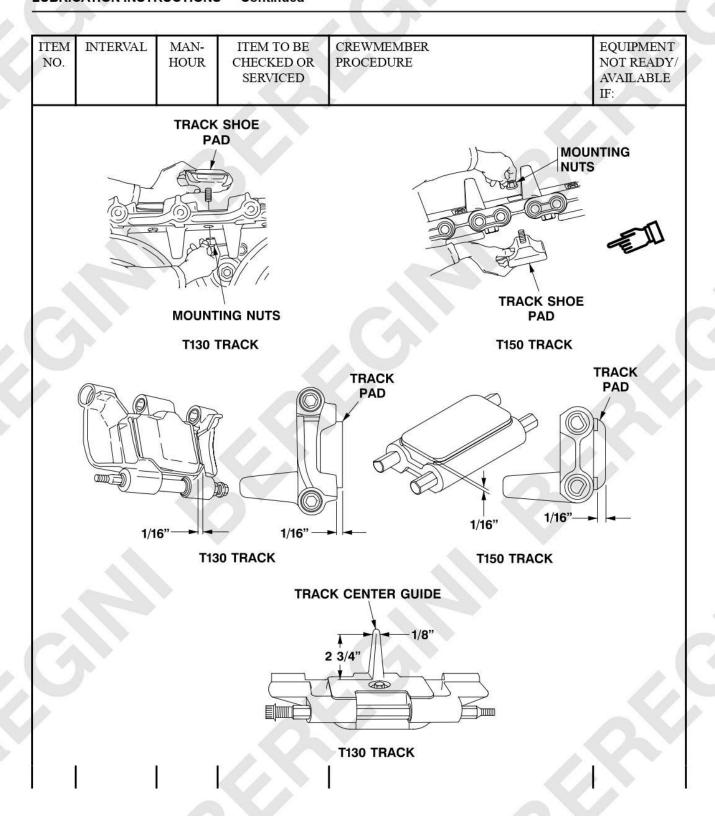
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ITEN NO		MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
7	Semi- Annual		Track Tension Adjuster	a. Check adjuster for broken or cracked hardware on both carrier sides. Replace damaged parts (WP 0356 00).	Adjuster or hardware is failed, leaking or missing.
				HARDWARE	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
8	Semi- Annual		Track Pin/Nuts (T130 Track Only)	a. Check track pin nuts for looseness or cracks. Replace cracked nuts. Check trapins for stripped threads. Replace stripped track pins. TIGHTEN LOOSE NUTS T 115-135 LB-FT (156-183 N·M) TORQU Use torque wrench (WP 0541 00, Item 1980).	ed cracked, O broken, bent, JE. stripped,
9	Semi- Annual		Track shoe end connector/bolts. (T150 Track Only)	a. Check all end connectors/bolts for crack and looseness. Check bolts for stripped threads. TIGHTEN BOLTS TO 400-430 LB-FT (543-588 N·M) TORQUE. Use torque wrench (WP 0541 00, Item 72)	connectors that
	Q.				
		ZIL		EN CONNECTO	
\hat{c}	TRACK PIN NUTS		TRACK PINS		
\vee		T	130 TRACK	T150 TRACK	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
10	Semi- Annual		Track Grouser. (T130 Track Only)	a. Check grouser for wear or cracks on both tracks. Replace track shoe if grouser measures less than 1/8" (3 mm) in height or if grouser is cracked.	Grouser is worn below 1/8" or cracked.
			0		

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				GROUSER 1/8"	
			1/8" T130 TR	1.1	
			1130 IN.		

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
11	Semi- Annual		Track Shoe Pads and Mounting Studs/Nuts	a. Check track shoes pads and mounting for looseness and stripped threads on both tracks. If mounting nuts are stripped, replace track shoe pad (T130 Track) (WP 0359 00) (T150 Track) (WP 0359 02). TIGHTEN LOOSE NUTS TO 135-155 LB-FT (183-210 N·M) (T130 TRACK). 120-150 LB-FT (160-203 N·M) (T150 TRACK). Use torque wrench (WP 0541 00, Item 70).	Studs/nuts are cracked, stripped, missing or pad height is less than 1/16 in above grouser. (T130 Track). Studs/nuts are cracked, stripped, missing, or pacheight is less than 1/16 in above track shoe (T150 Track).



100						
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED		EWMEMBER OCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
12	Semi- Annual		Idler and road Wheel Arms	a.	Check cracked or bent idler arm or road wheel arms. Check idler or road wheel arm relief valves and grease fittings if leaking. Check for leaking road wheel arm seals and gaskets.	Any bent, broken, or cracked arm, leaking seal, or loose bearing.
13	Semi- Annual		Idler and road Wheel Mounting Nuts	a.	Check idler and road wheel mounting nuts for looseness. TIGHTEN LOOSE NUTS TO 150-170 LB-FT (203-230 N·M) TORQUE.	Any missing or stripped nuts.
	5					
			3			
	5					

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED		EWMEMBER OCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
14	Semi- Annual	Q	Idler/Road Wheels and Idler/Road Wheel Hubs	a.	Check for cracked, broken, or bent idler/road wheels and idler wheel hubs.	Any broken, bent, or cracked idler road wheels or leaking hub seals.
				b.	At each service, or whenever track is removed, adjust wheel bearings if looseness or end play is evident (WP 0351 00).	Any loose bearings or Class III leaks.
				c.	Check for leaking seals and gaskets.	
				d.	Check for leaking grease fittings and relief valves.	Any leaking grease fittings.
		I .	l.		IDLER WHEEL	
					IDLER WHEEL	
	IDLER	ARM			12 1	
	GREASI FITTIN		RELIEF VALVE		WHEEL BEARINGS	
				/		
1		4		_	IDLER WHEEL HUB	
						4

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
15	Semi- Annual		Idler and Road Wheel Hub Ribbed Bolts	a. Check for bent, broken, or stripped idler/road wheel hub ribbed bolts.	Any broken, bent, and stripped bolts.
		IOUNTING N	MOUNT UTS HARDW		
	MOUNTING HOLES	MOUNTING N	RIBBED		
			ROAD WHEEL HUBS		
16	Semi- Annual		Road Wheel Arm Mounting Hardware and Support Bumpers	a. CHECK AND TIGHTEN LOOSE ROAD WHEEL ARM MOUNTING HARDWARE TO 130-140 LB-FT (176-190 N·M) TORQUE. Check for missing or loose road wheel arm support bumpers.	Any loose mounting hardware.
17	Semi- Annual		Road Wheel Mounting Holes	a. Check for road wheel mounting holes extending beyond head of mounting nut.	Any elongated holes that extend beyond mounting nuts.
	MOUNTING	S NUT		O WHEEL ARM ING HARDWARE	
	MOUNTING				

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
18	Semi- Annual	9	Shock Absorber	a. Check shock absorbers for leaks, dents, cracks, or loose bearings. Replace shock absorber that is bent, broken, cracked, or dented enough to hinder operation. Replace worn bearing (WP 0379 00).	Any cracked, broken, bent, or missing shocks or dents that hinder shock operation.
				b. Check shock absorbers for Class III fluid leaks or loose fitting bearings.	Any Class III fluid leaks.
				c. Check shock absorber mounting hardware for looseness. TIGHTEN LOOSE HARDWARE TO 130-140 LB-FT (176-190 N·M) TORQUE.	
				d. Check shock absorber bracket mounting hardware for looseness. TIGHTEN LOOSE HARDWARE TO 130-140 LB-FT (176-190 N·M) TORQUE.	
		I		K ABSORBER BRACKET	
			SHOCK ABSORBER	SHOCK ABSORBER IMOUNTING HARDWARE	
C					

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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
19	Semi- Annual		Sprocket Mounting Bolts	 a. Check sprockets on both tracks for wear indicating that mounting bolts have come loose. TIGHTEN LOOSE BOLTS TO 110-115 LB-FT (149-156 N·M) TORQUE. Use torque wrench (WP 0541 00, Item 72). b. Check sprocket cushions for wear. Replace cushions if gouges, chips, or cuts cause thumping (T130 Track) (WP 0357 00) (T150 Track) (WP 0357 01 or WP 0357 02). 	Any bolts are missing, loose, or worn.
5		SPROCKET		SPROCKET CUSHIONS	
	T130 TRA	СК	T150 TR	ACK	

ITEM	INTERVAL	MAN-	ITEM TO BE	CREWMEMBER	EQUIPMENT
NO.	Property developer and a confidence of pro-	HOUR	CHECKED OR SERVICED	PROCEDURE	NOT READY/ AVAILABLE IF:
20	Semi- Annual	9	Sprocket Hub Bolts	a. Check sprocket hub bolts for looseness or missing, bolts. TIGHTEN LOOSE BOLTS TO 170-190 LB-FT (231-258 N·M) TORQUE. Use torque wrench (WP 0541 00, Item 72). If bolts are missing, replace (T130 Track) (WP 0357 00) (T150 Track) (WP 0357 01 or WP 0357 02).	Any bolts are missing, loose or worn.
	SPROCKET HUB BOLTS		SPROCKET HUB BOLTS		
	T130 TRA	ck	T150 TF	RACK	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
21	Semi- Annual		Towing Pintle, Tow Hooks and Lifting Eyes	a. Check and replace missing or damaged retaining pins and keys (WP 0377 00). Check if towing pintle is securely mounted and operates satisfactorily.	
			SCREW (6	EYE	
-				HOOK	
•				LIFTING EYES	
				LIFTING EYES	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
22	Semi- Annual	8	Tailgate and Cab Doors	a. Check cab doors and tailgate for ease of movement, damaged seals, and general condition. Tighten loose hardware and check adjustments for watertight fit. Adjust if required (WP 0388 00 and WP 0405 00).	
		SEA		CAB DOOR	
				SEALS TAILGATE	

TITEM NO. INTERVAL HOUR CHECKED OR CHECKED OR SERVICED 23 Semi-Annual Cab and Rear Compartment Covers CORD BOW CORD BOW COVER M548A3 SHOWN EQUIPMENT NOT READY AVAILABLE IF: EXAMPLE	All		 		
Annual Compartment Covers broken ropes, and damaged grommets. Replace broken rope. Replace covers that are damaged (WP 0417 00 and WP 0418 00).		INTERVAL	CHECKED OR		NOT READY/ AVAILABLE
COVER STRAP	23		Compartment	ropes, and damaged grommets. Replace broken rope. Replace covers that are	
COVER			c	BOW	
COVER					
ROPE					
M548A3 SHOWN				ROPE	
			Ĭ	M548A3 SHOWN	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
24	Semi- Annual		Taillights and Stoplights	a. Check and replace discolored and cracked taillight lens (WP 0278 00). With helper's assistance, check operation of service taillight, service stoplight, blackout taillight, and blackout stoplight (see your -10). Repair or replace lights that do not work (WP 0275 00, WP 0276 00, or WP 0278 00) as required.	
		LEFT STOP	LIGHT-TAILLIGHT	RIGHT STOPLIGHT-TAILLIGHT	
		INSTAL	LED VIEW	b. Check and replace missing retaining pin or key (WP 0278 00).	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
25	Semi- Annual		Trailer Wiring Harness Receptacle Cover	a. Check cover for tight seal on wiring harness receptacle. Replace leaky cover (WP 0301 00).	
~			ONNECTOR, SPRING	RECEPTACLE, COVER, AND GASKET	
26	Semi- Annual		Headlights, Blackout Lights, and Horn	a. Check and replace cracked or discolored lens in service headlights, blackout marker lights, or blackout headlight (WP 0276 00, WP 0277 00, WP 0280 00, or WP 0275 00) as required.	
		111/2		WARNING	
				Looking directly at infrared headlights may burn your eyes. Do not look directly into infrared headlights. Use your hands to feel the heat.	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. With helper's assistance, check operation of service headlights, infrared headlights, blackout marker lights, blackout headlight, and horn. Repair or replace lights or horn that do not work (WP 0275 00, WP 0276 00, WP 0277 00, WP 0280 00, and WP 0289 00).	
		BLACKOU HEADLIGH			
	INFRARED HEADLIGHT			HORN RVICE DLIGHTS	RARED
	BLACK	COUT MARKE	ER .	BLACKOUT	DLIGHT
Î				MARKER LIGHT	į.
27	Semi- Annual		Pivot Steer	a. Remove plugs and check fluid in both master cylinders (WP 0371 00). Add fluid (FRH) as necessary to bring it within 1/2 to 3/4 inch (1.27-1.90 cm) from top cylinder.	Either master cylinder is empty or leaking. Any Class III leaks.
					4

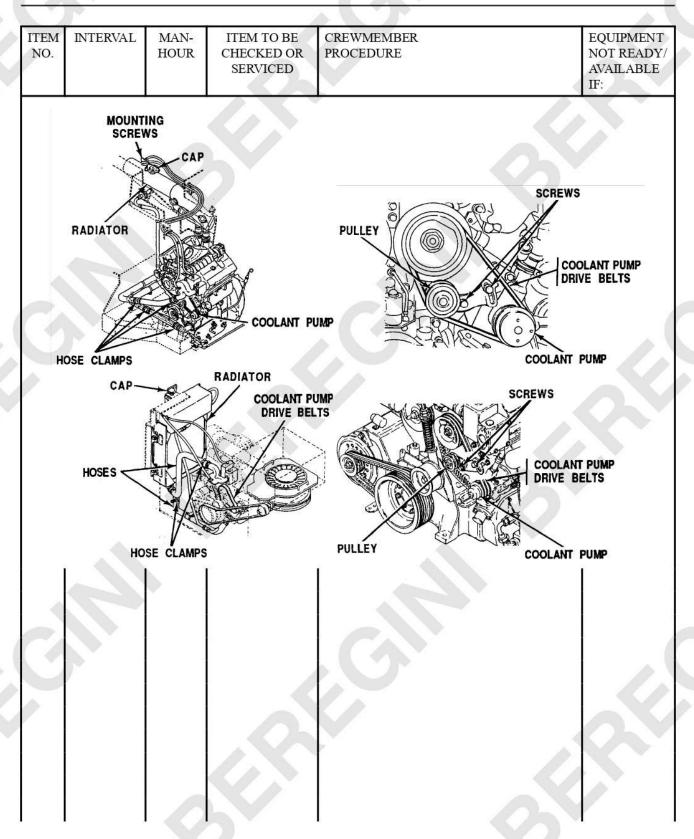
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
28	Semi- Annual		Torsion Bar, Anchors, or Splines	a. TORQUE ANCHOR SCREWS TO 320-330 LB-FT (434-447 N·M). When power plant is removed, torque power plant compartment anchor screws.	Any broken, bent, missing, stripped torsion bars or attaching hardware.
				b. If so equipped, replace missing or damaged pins or cotter pins on torsion bar anchors (WP 0350 00).	
				c. Check that torsion bar plugs are fully seated and retaining screws are tight.	
		ANCHOR SCE	100	TORSION BAR ANCHOR	
		227	00	OTTER PIN	
				SPLINES	
	7/14	Es	PLU	G RETAINING SCREW	5
			De Contraction of the Contractio		Ó
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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
29	Semi- Annual	9	Track (T130 Track Only)	a. TORQUE LOOSE TRACK PIN RETAINING NUTS 115-135 LB-FT (156-183 N·M). Check for missing, damaged, or worn track pads or track shoes. TORQUE LOOSE TRACK PAD RETAINING NUTS TO 135-155 LB-FT (183-210 N·M).	Any pins/nuts that are cracked, broken, bent, stripped, missing, or protruding.
				TRACK PADS PINS NUTS RETAINING NUTS	
		9			

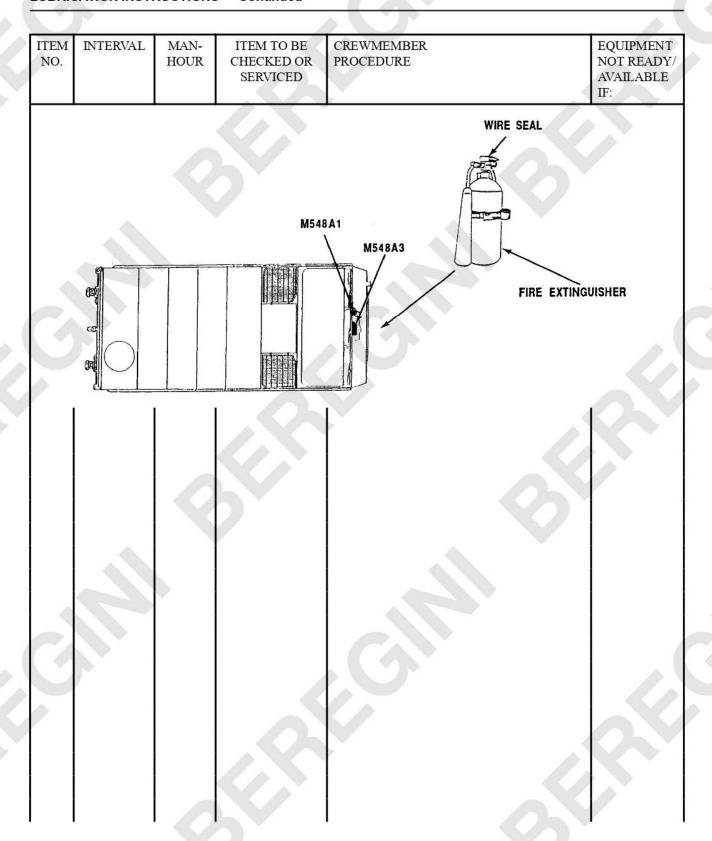
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
30	Semi- Annual		Track Assembly (T150 Track Only)		
			205V	NOTE	
				The T150 track assembly is to be reversed semi-annually. It needs to be reversed to put wear on the end connectors and track shoe bushings in both directions.	
				NOTE	i.
				The end connector can only be checked with the track gauge when it is removed from the track shoe pins.	
				NOTE	
			8	The T150 track assembly needs to be reversed to put wear on the end connectors and track shoe bushings in both directions. This will exend the life of the track. If it is not reversed, the track will wear unevenly and the life of the track will be reduced.	
				a. Use the track gauge on the inside or facing side of the end connector toward the track shoe when it is removed. The track gauge slot is a no-fit condition. If it does not fit, the end connector is still good for use. When the material on the end connector gets too thin and the track gauge fits, the end connector is bad and needs to be replaced with a new one.	
V					

NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	A 100 CO	EEWMEMBER OCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
	TRACK GAUGE	CONNE		,,,		
31	Semi- Annual		Cooling System	a.	Addition of extender to antifreeze is a one time service. When extender is added to antifreeze, the date must be recorded in the "remarks" block of DD Form 314. If DD Form 314 identifies the unsafe coolant as having been extended before or the coolant as arctic antifreeze, then the coolant must be drained and replaced with fresh coolant (WP 0212 00 and WP 0213 00, or WP 0214 00), as required.	
				b.	Check coolant cleanliness by draining a small amount of coolant into a clean container and look for excessive rust, foreign particles, and/or sediments.	Excessive coolant contamination is found.

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
32	Semi- Annual		Cooling System Radiator Hoses, Pump, and pump Drive Belts		
				NOTE	
		1		M548A1 access is through the passenger seat. M548A3 access is through the rear power plant rear access panel.	
				a. Check radiator and coolant pump for leal Check that all hose clamps and mounting screws are tight. Check cooling pump drive belt for 3/8 inch (10 cm) deflection cracks, and looseness. Tighten loose belt by adjusting pulley. Secure belt adjustme by tightening screws.	is loose or missing or has any Class III fluid leaks.
				WARNING	
				Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.	
				 Clean outside of radiator with air gun. Check cap and seal for damage that allow leakage. Replace or repair damaged hardware (WP 0215 00 or WP 0216 00) 	's



ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
33	Semi- Annual		Portable and Fixed Fire Extinguishers	WARNING You could be injured if cylinder discharges when it is out of its mounting brackets or is dropped.	
				Handle with great care. a. Weight portable fire extinguishers. Replace fire extinguisher if weight loss is more than 10 percent of charged weight shown on tag (WP 0526 00). Fill out DA Form 2402 for recharging or DA 2407 to exchange cylinders.	68
			%	CAUTION Fire extinguisher control valve sealed with wire will not work. Make sure seal wire is made out of light copper. b. Check wire seal. Replace broken or damaged seal (WP 0524 00 or WP 0525 00).	



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NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED		EWMEMBER OCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
34	Semi- Annual		Fixed Fire Extinguisher	a.	Remove and weigh fixed fire extinguisher cylinder (WP 0526 00). If cylinder is low, refill.	
			8) V	b.	Before reconnecting or replacing cylinder, operate discharge handles and be sure cables and controls work right.	5
				c.	Install cylinder and replace copper seal wires (WP 0527 00 or WP 0528 00).	
		77		d.	Replace discharge tubes that are crimped or cracked (WP 0524 00 or WP 0525 00).	
		CC	PPER SEAL WIRE	l		
			Ĭ	ARGE	HANDLES	
		**			DISCHARGE	
					TUBES	
		1				
				Ŋ		
		6			CYLINDER	
	1	i			CYLINDER	
. (re.	COPPER SEAL WIRE	
6			2			
				1		
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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE
35	Semi- Annual		Driver's and Cab Personnel Seats		IF:
				NOTE	
				M548A1 have two passenger seats. M548A3 has only one passenger seat.	
				a. Check and replace damaged seat cushions (WP 0397 00 or WP 0398 00).	
			3: 	b. Check and replace damaged straps (WP 0397 00 or WP 0398 00).	
				c. Check and replace damaged hinges (WP 0397 00 or WP 0398 00).	
Ű				d. Check and replace damaged seals (WP 0397 00 or WP 0398 00).	
				e. Check and replace damaged belts (WP 0399 00).	
		SEAT BEL	TS		
				SEAT CUSHIONS	
4	SEAT BELT				
			SEAT BEI	TS	
1			STRAPS		CAY
		18-	Į .		
			SEAL		

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
36	Semi- Annual		Batteries	WARNING	
				Before you connect or remove battery cables, ventilate battery compartment. Always disconnect the battery negative lead(s) first and connect it last. Don't cause sparks. Hydrogen explosions can cause serious injury. Battery acid can blind or burn you. Do not get acid on your skin or in your eyes.	
				Battery posts and cables touched by metal objects can short circuit and burn or injure you. Use caution when you work with tools and other metal objects. Do not wear jewelry when you work on electrical system. Electrical current can burn you. Remove both battery negative leads before you start task (WP 0292 00).	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		9		M548A1 carriers have two batteries. M548A3 has four batteries. a. Clean batteries and battery box (WP 0290 00) or (WP 0291 00).	Dead, cracked, or leaking
				b. Check and replace batteries for leaks, cracked cases, and/or burned posts.	batteries.
					<
				BATTERY	
			M548A3 SHOWN		
3		3	ľ a	BATTERY BOX	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				Gas from batteries can explode and injure you. Do not allow sparks near batteries. Battery acid can blind or burn you. Do not get acid on your skin or eyes. c. Check electrolyte level in all cells of batteries. Add distilled water as needed TM 9-6140-200-14.	Any leaks, loose, damaged, burned post, cracked, broken, missing batteries or
			0	d. Test specific gravity of batteries TM 9-6140-200-14.	hardware. Cell is below specific gravity.
				e. Clean vent holes in cell caps (WP 0290 00 or WP 0293 00).f. Clean terminals, posts, and bolts (WP 0290 00 or WP 0293 00).	One or more batteries unserviceable, missing, broken, or frayed cables.
				g. Tighten terminals and bolts with care to avoid damage to batteries. Apply light coat of GAA grease (WP 0542 00, Item 14).	One or more batteries unserviceable, missing, broken, or frayed cables.

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			PO	ST BOLT VENT HOLE NEGATIVE POST	
		1 8	M548A3 SHO	DWN	
37	Semi- Annual		Fuel System	a. Inspect fuel lines, fuel pumps, and fuel cap for leaks, bent/buckled, deteriorated lines, chaffed hoses, fittings, electrical connectors, and wires for security, looseness, or frayed wires.	
38	Semi- Annual	~	Engine Fuel Pump	a. Check engine fuel pump for leaks.	Any fuel leak.
				ENGINE FUEL PUMP	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
39	Semi- Annual		Electric Fuel Pumps	a. Check electric fuel pumps lines for leaks.	Any fuel leak.
	M548A3		ELECTRIC FUEL PUMPS	M548A3	
40	Semi- Annual		Air Separator Tank	a. Check air separator tank and lines for leaks.	Any fuel leak.
			0	AIR SEPARATOR TANK	

ITEM	INTERVAL	MAN-	ITEM TO BE	CREWMEMBER	EQUIPMENT
NO.	INTERVAL	HOUR	CHECKED OR SERVICED	PROCEDURE	NOT READY/ AVAILABLE IF:
41	Semi- Annual	0	Filler Cap	Check filler cap, strainer, and hoses for leaks and damage.	Missing filler cap. Any fuel leak.
3					
				FILLER CAP	
		DA		STRAINER	
			HOSE		
2					
		3			

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
42	Semi- Annual		Fuel Filters Primary/ Secondary	a. Replace primary and secondary fuel filter elements (WP 0178 00 or WP 0179 00). Check for leaks.	Any fuel leak.
				SECONDARY FUEL FILTER PRIMARY FUEL FILTER	
	_ > ∴	8 1		M548A3 SH	IOWN

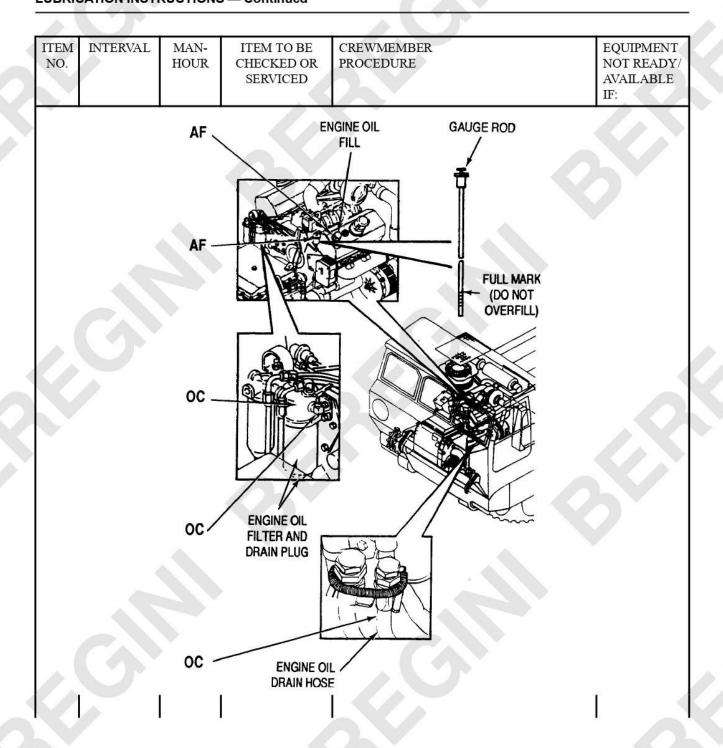
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
43	Semi- Annual	<	Air Box Heater Air Pump	a. Check operation of air box heater air pump (see your -10). Disconnect lead from fuel shutoff solenoid valve. Have helper pull out fuel shutoff and intermittently crank engine and run air pump at same time for total of 20 seconds. Connect lead to fuel shutoff solenoid valve.	Any fuel leak.
	AIR PU	MP			
	SOLENOID				
				(a) A	

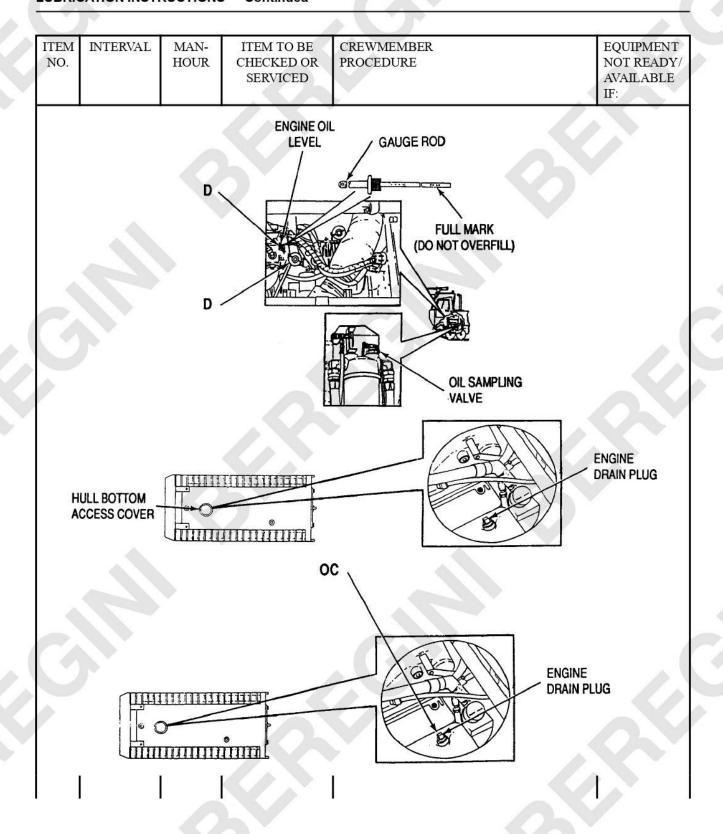
All					-
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
44	Semi- Annual		Electrical Wiring, Interior Lights and Switches	a. Check and tighten electrical connections, radio suppression straps, and component mounting bracket screws. Tape frayed harness and replace missing or defective chassis grommets and connections. Secure, repair, or replace lights and switches that are insecurely mounted, inoperative, or damaged. See WP 0240 00 thru WP 0303 00 for specific task.	
WIP	CIRCUIT 71A LEAD	CIR	CUIT LEAD	CIRCUI 10D LE	
	WINDSHIELD WIPER MOTOR CIRCUIT 71 LEAD		M548 ASHER	MASTER SWITCH CIRC 6 LE	
				CIRCUIT 50 LEAD	

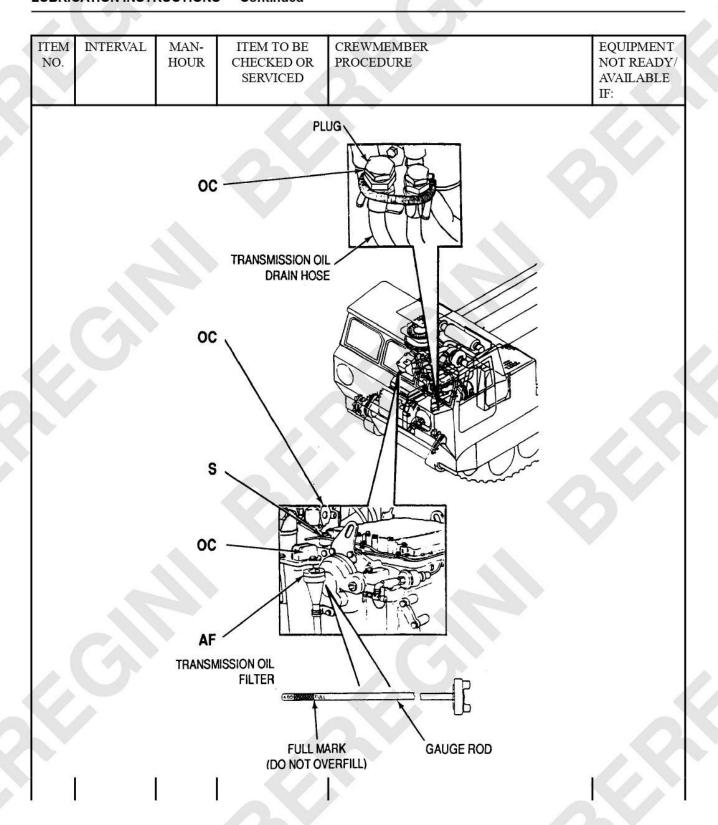
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
45	Semi- Annual	9	Bilge Pump	NOTE Location of bilge pump is accessed through right floor plate on M548A1	
				and through hull bottom access cover on M548A3. a. Check operation of fuel pump (see your -10). Turn MASTER SWITCH ON. Turn bilge pump switch ON. Make sure forward bilge pump light is on. Look for stream of water or feel for a stream of air at the bilge pump outlet. When finished with bilge pump checks, turn off bilge pump switch, turn MASTER SWITCH OFF.	
		DUNTING CREWS	HOSE CLAM		
			OUTLET	EN	
	PUMP	MO	UNTING M548	A1 SHOWN	

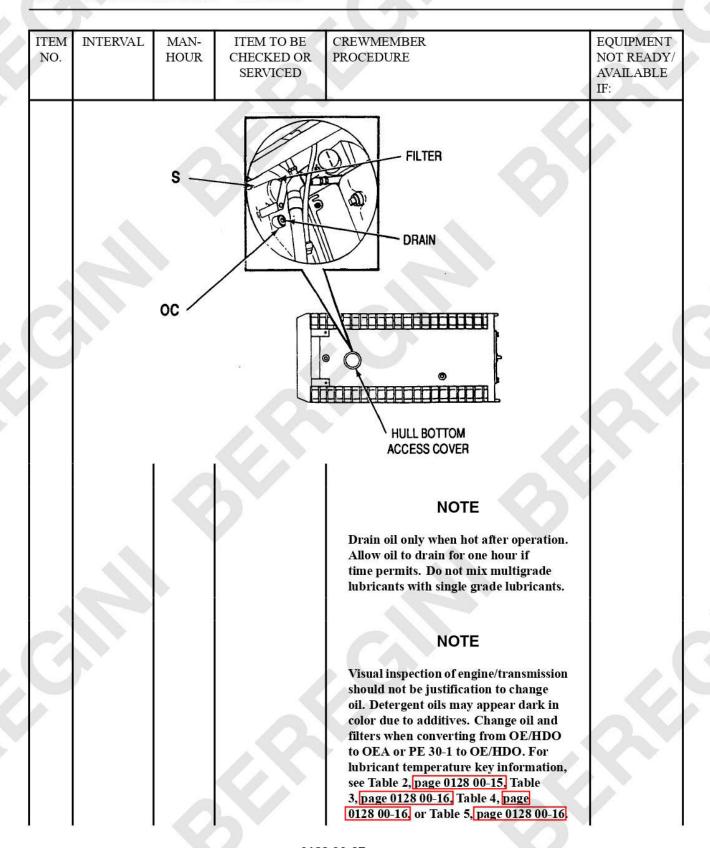
ITEM	INTERVAL	MAN-	ITEM TO BE	CREWMEMBER	EQUIPMENT
NO.		HOUR	CHECKED OR	PROCEDURE	NOT READY/
			SERVICED		AVAILABLE
44	~				IF:
46	Semi- Annual	0.4	Engine and Transmission		
	2 Militar		Tidisilission		
				WARNING	
	8			Gu, illius .	
		7/1/2		010100000000000000000000000000000000000	
				Hot parts can burn you. Use care when	
				working near hot components.	
(a. With engine at idle, sample engine oil	AOAP
				and transmission oil as instructed by your	recommends
				standard operating procedure. See TB 43-0106. For lubricant information, see	oil change.
				Table 2, page 0128 00-15 Table 3, page	
V			4	0128 00-16, Table 4, page 0128 00-16, or	
				Table 5, page 0128 00-16	
>				b. HARD TIME Hard time interval may be	Hard time
				shortened if equipment operates under adverse conditions (for arctic operations,	interval exceeded.
				refer to FM 9-207; for desert operations,	
				refer to FM 90-3.	
				CAUTION	
	1			Engine and transmission can be	
				damaged if filled above the FULL (F)	
				mark on the gauge rods.	
					1
				No.	1
1				NOTE	
				If AOAP laboratory is not available,	
				drain engine oil and change filter	
			4	element/gaskets every 150 hours, 1500 miles (2414 km), or semi-annually.	
				Transmission oil should be drained and	
				filter element/gaskets changed every	
			AV	150 hours, 1500 miles (2414 km), or	
J. 10.		Į.		semi-annually.	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		0		Always change filters on transmission and engine even when using AOAP every 150 hours, 1500 miles (2414 km), or semi-annually.	
				c. ON CONDITION To drain engine or transmission oil, remove hull bottom access cover and drain plug. Inspect oil for metal particles. If metal particles are found, notify your supervisor. Replace engine or transmission oil filters each time an oil change is required.	

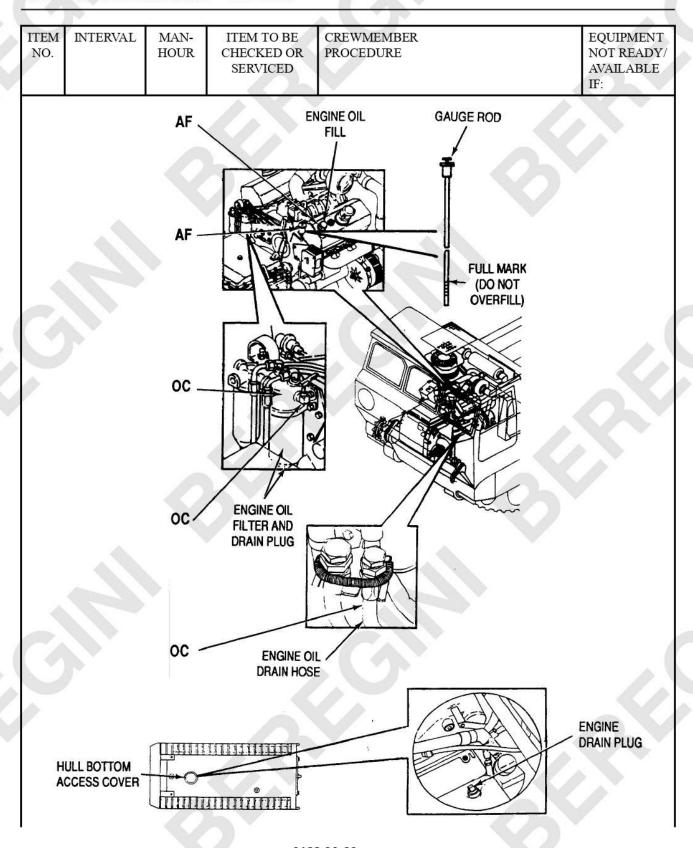








ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				d. Clean inside of engine filter cover or transmission filter cavity with cleaning compound.	
			0	e. Install new engine filter element/gasket WP 0145 00 or WP 0146 00) or transmission element/packing (WP 0320 0 or WP 0321 00).	o
				f. Refill engine with approximately 18 quart (17 liters) of OE/HDO or OEA. Bring level between full and low marks on gauge rod. Start and run engine (see your -10) and check for oil leaks.	
				g. Refill transmission with approximately 16 quarts (15 liters) for M548A1 or 12 gallor (45 liters) for M548A3 of OE/HDO or OE after oil change. Start and run engine (see your -10) and operate transmission throug all gear selector positions.	s leaks. A
				 h. Check operation of engine and transmission. Run engine (see your -10) and check for oil leaks at filter and drain plug. Inspect access covers on hull bottom for leaks and replace gasket or cover if required (WP 0383 00). 	Any Class III leaks.



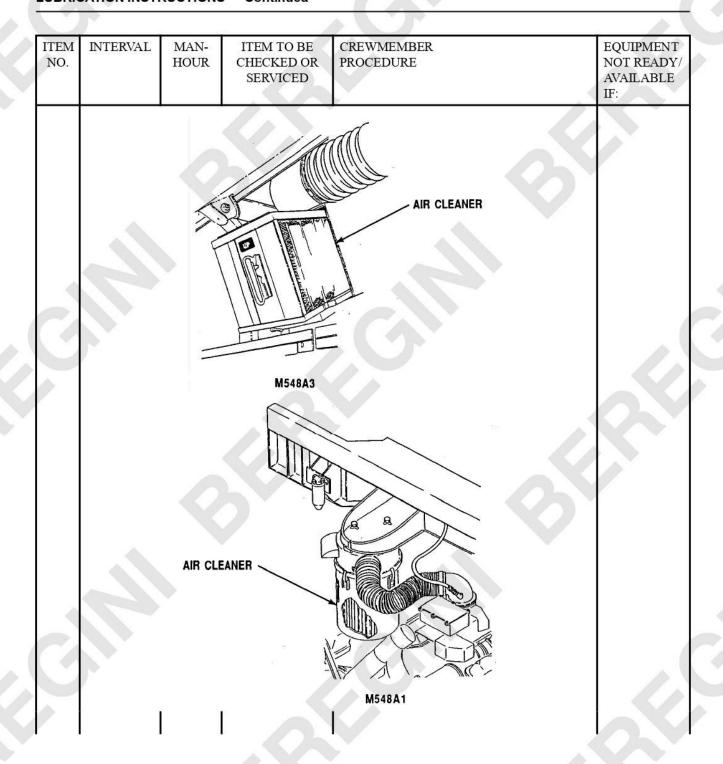
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
47	Semi- Annual		Power Plant Mounting Components	a. Check power plant components for looseness. If any of the mounting components on starter, generator, etc., are loose, tighten.	
	× ×			VER PLANT MPONENTS	
	POWER PLANT COMPONENTS	DLER PULLE	P	ENGINE COOLANT PUMP BELT DRIVE PULLEY OWER PLANT OMPONENTS M548A3 SHOWN	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
48	Semi- Annual (M548A3)	0	Engine Coolant Pump Belt	a. Check engine coolant pump belt tension (WP 0224 00).	Belts are cracked, frayed, broken or too loose.
				VER PLANT	4.7. 1.7.
	POWER PLANT COMPONENTS	DLER PULLE	P	ENGINE COOLANT PUMP BELT DRIVE PULLEY OWER PLANT OMPONENTS M548A3 SHOWN	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
49	Semi- Annual (M548A3)		Drive Belts	a. Check fan belts for proper tension. Adjust, if needed (WP 0227 00).	Belts are cracked, frayed, broken or too loose.
				b. Check generator drive belts for proper tension. Adjust, if needed (WP 0245 00).	
				c. Replace frayed or cracked belts (WP 0227 00 or WP 0245 00).	
	35		POV	ER PLANT	E E
			COM	PONENTS	
		Z	9		
		6		ENGINE	
V		L		PUMP BELT	
	POWER PLANT	(DRIVE PULLEY	
	COMPONENTS				
	1	DLER PULLE	Y		
			P	FAN BELT DWER PLANT DMPONENTS M548A3 SHOWN	
					1
V					
*			1		
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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
50	Semi- Annual (M548A3)		Cooling Fan	a. Check for cracked drive pulley and idler pulley (WP 0229 00).	Bent or cracked pulley.
			POW	VER PLANT MPONENTS	
4				ENGINE	
3	POWER PLANT	8		PUMP BELT DRIVE PULLEY	
>	COMPONENTS				
	ıc	OLER PULLE		FAN BELT OWER PLANT	
		×	d	OMPONENTS M548A3 SHOWN	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
51	Semi- Annual		Air Cleaner	CAUTION Operation with dirty or improper air cleaner element can cause poor performance and severe engine damage due to abrasive action. Make sure	
				element is clean and properly installed. a. Inspect air cleaner. Clean as required.	Air filter or hoses damaged or missing.
				b. Clean or replace air cleaner element(WP 0152 00 or WP 0156 00).	
				c. Replace damaged air cleaner housing (WP 0152 00 or WP 0159 00).	
				d. Check for cracked, broken, or brittle air cleaner hoses.	,0



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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
52	Semi- Annual		Drive Shaft	a. Check for loose screws on 7C universal joints. TIGHTEN LOOSE SCREWS TO 86-94 LB-FT (117-127 N·M) TORQUE (M548A3) AND 35-40 LB-FT (47-54 N·M) TORQUE (M548A1). Loosen and retighten screws to the above torque value.	
		AFAGA 2		TC UNIVERSAL JOINT SCREWS UNIVERSAL JOINT SCREWS	EW
		1548A3	C UNIVERSAL JOINT	SCREWS 7C UNIVERSAL JOINT	
			SCRE	WS M548A1	
				 b. Check for loose screws on 6C universal joints. TIGHTEN LOOSE SCREWS TO 35-40 LB-FT (47-54 N·M) TORQUE. Use torque wrench (WP 0541 00, Item 3A) (M548A1). Loosen and retighten screws to the above torque value. c. If universal joint has lubrication fittings, lubricate with GAA (Table 15, page 0128 00-19) 	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		M54	BA1	SCREW SCREW SCREW 548A1 6C UNIVERSAL JOINT	
53	Semi- Annual (M548A3)		Steering Rod and Connecting Link	a. Check steering linkage lever on top of transmission for ease of movement from low to full position. If linkage does not move easily, troubleshoot steering system WP 0006 00.	Loose or damaged steering rod and connecting link.
		STEE	RANSMISSION	LEVER	
54	Semi- Annual (M548A3)		Power Plant Compartment	a. Clean power plant compartment with cleaning compound. Remove debris and wipe up spilled oil and fuel.	

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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
55	Semi- Annual (M548A3)	<i>///</i> = 11	Power Plant Mount	a. Check mounts and screws for looseness. TIGHTEN LOOSE SCREWS TO 100-120 LB-FT (136-163 N·M) TORQUE.	Loose or broken mounts or screws.
			MOU		
56	Semi- Annual (M548A3)		Transmission Breather	Remove transmission breather and check for cracks, dents, and stripped threads. Replace damaged breather.	Breather broken or missing.
				b. Clean transmission breather with cleaning compound. Dry breather and install on transmission.	Breather broken or missing.
				TRANSMISSION BREATHER	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
57	Semi- Annual (M548A3)	0.3	Fan Gearbox	a. Check fan gearbox oil level and add oil, if needed. For lubricant information, see Table 10 page 0128 00-18	Empty or leaking fan gearbox.
				FITTING	
		1		PLUG (FILL) OIL LEVEL SIGHT GLASS CAP AND LOCKING WIRE	
				(DRAIN PORT)	

0128 00-79

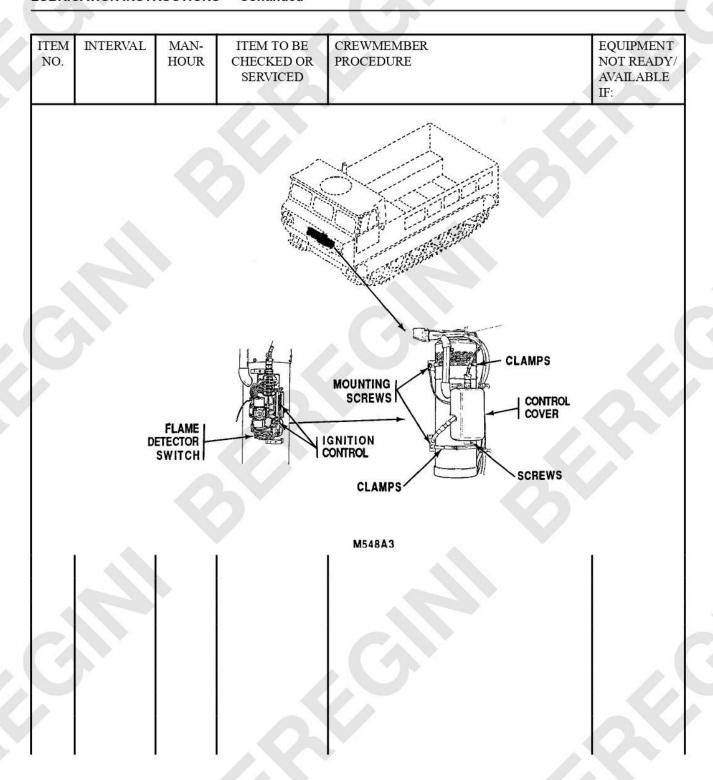
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
58	Semi- Annual (M548A3)		Radiator	a. Clean radiator (WP 0214 00). Check and replace leaking radiator (WP 0216 00). OIL LEVEL	Damaged or leaking radiator.
			FAN	RADIATOR AUXILIARY TANK	

NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
59	Semi- Annual (M548A3)	0	Parking Brake	a. Check parking brake linkage for proper adjustment. If parking brake handle does not move easily, adjust (WP 0345 00).	
		EUT	TEL THI	TRANSMISSION SHIFT CONTROL	
			RKING BRAKE HANDLE	SERVICE PEDAL BRAKE PEDAL	
60	Semi- Annual (M548A3)	X	Service Brake Linkage	Check service brake pedal and linkage for proper adjustment (WP 0347 00).	Broken, loose or missing parts.

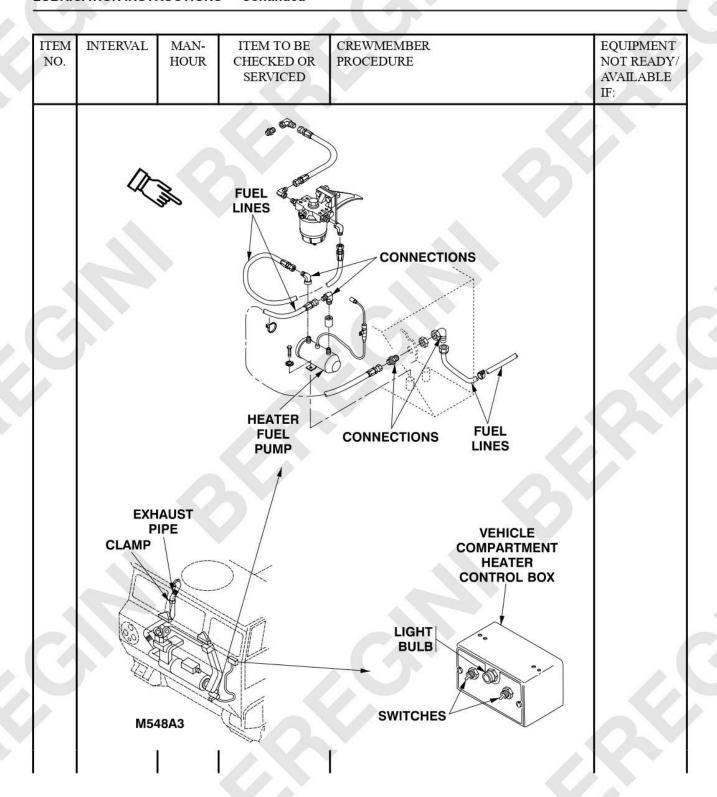
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
61	Semi- Annual (M548A3)		Throttle Controls and Transmission Linkage	a. Check hand throttle for ease of movement from low to full position. If throttle does not move easily, adjust (WP 0192 00).	
		FI CUT	JEL THI	HAND TRANSMISSION SHIFT CONTROL	
		РАГ	IKING BRAKE	ACCELERATOR	
			HANDLE	SERVICE PEDAL PEDAL	
					7
	9				

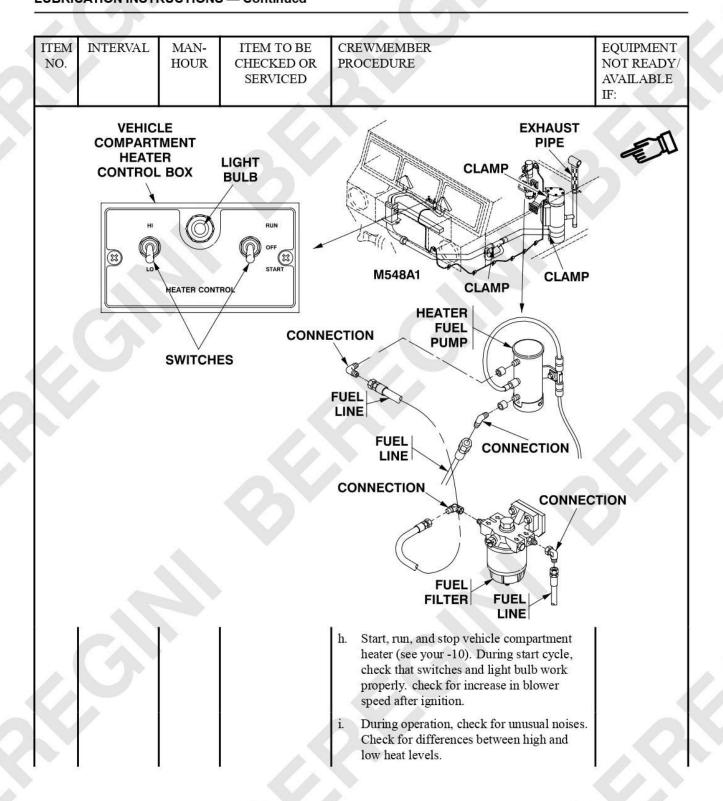
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
62	Semi- Annual (M548A3)		Fuel Cutoff	 a. Operate fuel cutoff to check for binding. If binding occurs, adjust (WP 0205 00). b. Operate accelerator pedal to check for binding in linkage. If binding occurs, adjust (WP 0200 00). c. Move transmission shift control through all gears to check for binding. If grinding occurs, replace (WP 0306 00). 	Binding, broken or missing parts.
		CUT	KING BRAKE	HAND HROTTLE TRANSMISSION SHIFT CONTROL ACCELERATOR	
		ran	HANDLE	SERVICE BRAKE PEDAL	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
63	Semi- Annual		Vehicle Compartment Heater	Tighten loose mounting screws and clamps on vehicle compartment heater.	
				b. Remove control cover by turning two screws to the left.	
	3			c. Check flame detector switch and ignition control. See TM 9-2540-205-24&P or TM 9-2540-207-14&P.	
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			0,		
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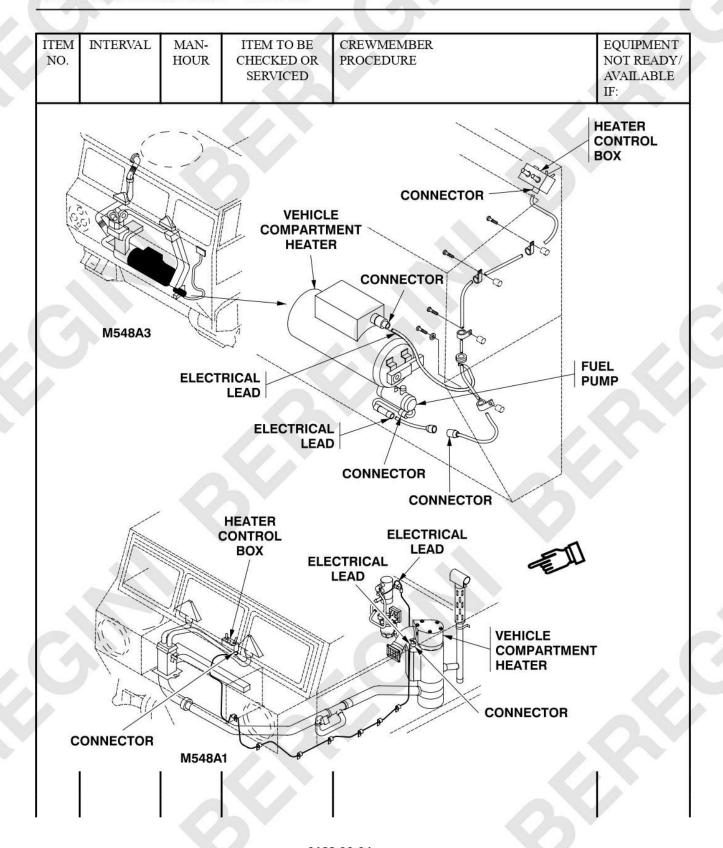
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				 d. Replace vehicle compartment heater fuel filter (WP 0436 00). e. Check vehicle compartment heater fuel pump, fuel lines, fuel filter (M548A1), fuel filter, and connections for leaks. Replace connections that continue to leak (WP 0427 00). f. Check for signs of exhaust leaks. Tighten clamps (WP 0427 00). g. Check vehicle compartment heater control box, switches, and light bulb. Tighten or replace bad switches and bulbs (WP 0431 00). 	





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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		<		j. When stopping vehicle compartment heater, check for correct purge cycle and that indicator light bulb works right. If heater does not operate as specified above, perform troubleshooting (WP 0085 00).	
		COMPA	HICLE ARTMENT EATER ROL BOX		
	OWITOW			VEHICLE COMPARTMI HEATER CONTROL E SWITCHES	ENT
	SWITCH	LIGH BUL	T B	ID START PERSONNE HEATER	GHT ULB
		M548/	13	M548A1	

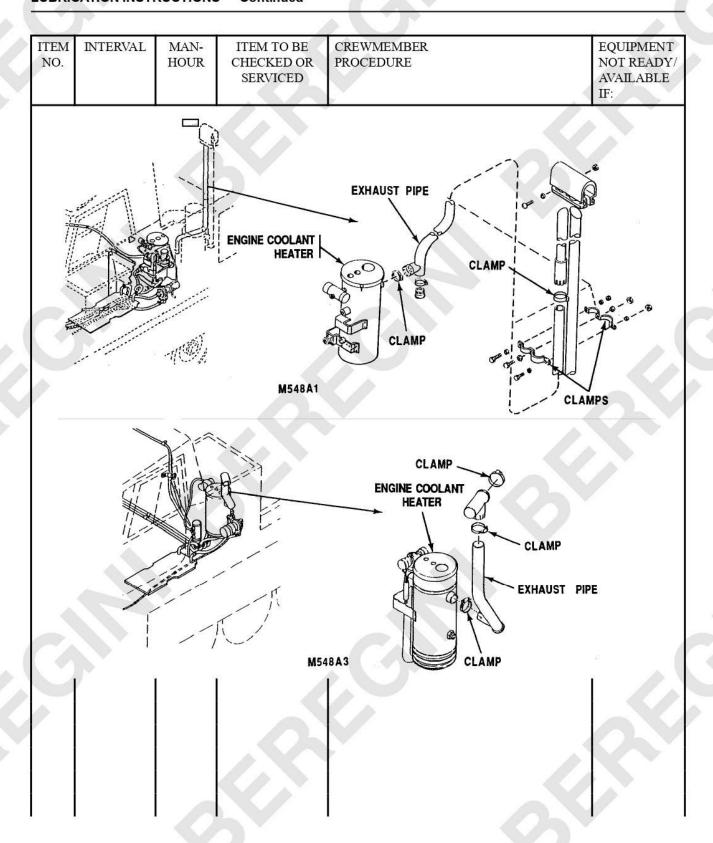
ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				k. Check electrical leads and connectors at vehicle compartment heater, heater control box, and fuel pump. Tape leads if frayed. Replace damaged connectors (WP 0431 00).	Any fuel leak.
	M548 A3	7.	VEHIC COMPART HEAT HEAT LECTRICAL LEAD	CONNECTOR CONNECTOR FUEL	PUMP



TM 9-2350-247-20-1

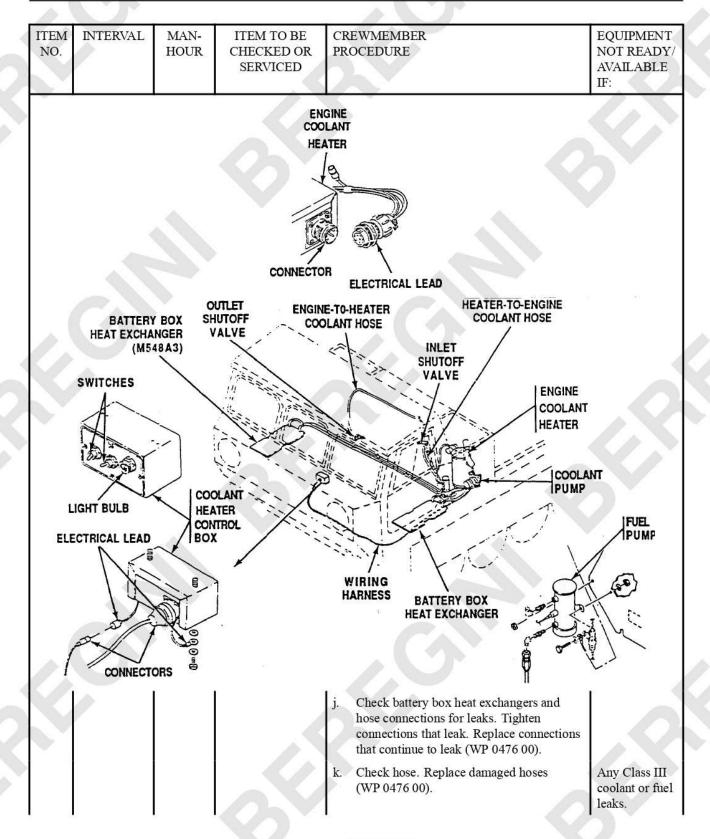
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING **LUBRICATION INSTRUCTIONS — Continued**

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
64	Semi- Annual		Engine Coolant Heater Kit	NOTE	
		11		Coolant lines on right side of battery are for M548A3 engine coolant heater. a. Check engine coolant heater clamps and exhaust pipes for exhaust leaks. Tighten clamps. Replace cracked or damaged pipe (WP 0480 00 or WP 0481 00).	Any exhaust leaks.



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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. Check fuel hoses, hose connections, and fuel pump for leaks. Tighten connections that leak. Replace connections that continue to leak (WP 0475 00).	
				c. Service fuel pump (WP 0449 00).d. Tighten fuel pump mounting screws.)
	HEAT EXC	SHUTOFF VERY BOX CHANGER M548A3)	COO	E-TO-HEATER HEATER-TO-ENGINE COOLANT HOSE INLET SHUTOFF VALVE ENGINE COOLANT HEATER	
		HEATE CONTRO BO	t The Control of the	COOLANT PUMF	
			WIRING HARNESS	BATTERY BOX HEAT EXCHANGER	
		FUEL HOSES	FUEL PUMP		D
		FUEL MOU	PUMP INTING REWS	M548A3 SHOWN	
			iLifo		

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				e. Check electrical leads and connectors at engine coolant heater, heater control box and fuel pump. Tape frayed leads. Repladamaged connectors (WP 0473 00).	
				f. Check heater control box, switches, and light bulb. Tighten or replace bad switch and bulb (WP 0474 00).	es
				g. Start, run, and stop heater (see your -10) During start cycle, check that switches a lights work properly.	
				h. During operation, check for unusual noise Check for increase in coolant temperature.	
				 When stopping heater, check for correct purge cycle. Check that indicator light works right. If heater does not operate a specified above, perform troubleshooting (WP 0086 00). 	



ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
	BATTERY B HEAT EXCHAN (M548A3)	OX IGER COOLANT			COOLANT
65	Semi- Annual (M548A3) Semi- Annual (M548A3)		NBC M1A1-19 Precleaner Assembly M3 Heater	 a. Check NBC M1A1-19 precleaner asses for normal operation (blower running air flow). Notify your supervisor for r of precleaner. a. Check NBC M3 heater for normal oper (heated air flow). Notify your supervisor for repair of NBC M3 heater. 	and epair ration

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
67	Semi- Annual (M548A3)		Switches and Indicators	a. Check for and tighten loose electrical connections and mountings. Replace broken indicator lights (WP 0264 00). Check indicator lights for normal operation.	
68	Semi- Annual (M548A3)	12	Hoses and Clamps	a. Check hoses for cracks and breaks. Replace cracked or broken hoses. check for leaks. Tighten hose clamps. Replace as required(WP 0537 00).	
69	Semi- Annual (M548A3)		Quick Disconnect Coupling	a. Check quick disconnect coupling for proper fit on protective mask and orifice connector assembly. Replace any defective coupling (WP 0538 00).	
70	Semi- Annual (M548A3)		Orifice Connector Assembly	a. Check valve and general condition of orifice connector. Replace valve or orifice connector as required (WP 0538 00).	
71	Semi- Annual (M548A3)		Air Flow (3.0-4.5 cfm) (.0813 cum)		
				NOTE	V
				Air flow should be 3.0-4.5 cfm (.0813 cum) (cubic feet/meter per minute)	
				a. Check each station using M39 air flow tester TM 3-6680-316-10.	
72	Semi- Annual (M548A3)		ID Plate	a. Replace identification plate if not legible (WP 0440 00).	
73	Semi- Annual (M548A3)		Paint	Paint surface to prevent rust or corrosion TB 43-0209.	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
74	Semi- Annual (M548A1)		Fan Generator Drive and Air Compressor Belts	a. Check fan and generator drive belts for cracks or looseness. Check idler adjusters for correct belt tension. Adjust them so adjusting nut is within range on sleeve instruction plate (WP 0226 00, WP 0241 00, or WP 0498 00). Every 500 miles (805 km), or semi-annually, lubricate fan drive shaft bearings with GAA grease through fittings at each end of shaft.	Any belt or pulley broken, cracked, bent, missing, or out of adjustment.
	FITTINGS		VE SHAFT VIT PULLEY	FITTING	
		IDLER ADJU		DRIVE BELT IDLER ADJUSTER	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
75	Semi- Annual (M548A1)		Transfer and Differential Gearcase Mounting	a. Check for loose mount pins or retaining clips on transfer and differential gearcases. Check for loose transfer clamps. TORQUE BOLTS TO 75-80 LB-FT (102-108 N·M).	Any cracked, broken, missing, or binding hardware.
				9 9 BO	J
	BOLT				
		CLA	The BOLT	MOUNT PINS RETAINII CLIPS	
	BOLT		1		

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
76	Semi- Annual (M548A1)	9	Differential Brake Adjustment	a. Using weighing scale (WP 0541 00, Item 43), perform pull test to inspect for proper operation of steering levers and differential brakes. With the levers locked at the second quadrant position, 10 to 30 pounds (4.5 to 14 kg) of pull should unlock the levers. Adjust differential brakes if needed (WP 0341 00).	
			DIFFERI	ENTIAL MOUNTS	
	DIFFE	RENTIALI)	ער שע שע	g	
Ú	N	RENTIAL 2		DIFFERENTIAL MOUNTS	
	*	•	MOUNT	DETAINING	
		25 25		RETAINING CLIPS / DIFFERENTIAL WEIGHING BRAKES SCALE	
				BRAKES SCALE	
			v.		
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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED		EWMEMBER OCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
77	Semi- Annual (M548A1)		Differential Oil Drain	a.	Differential oil every 150 hours, 1500 miles (2414 km), or semi-annually. Drain only when hot after operation. To drain, remove front hull bottom access cover and drain cover (WP 0337 00). Inspect drain cover and oil for metallic particles. If metal chips are found, notify your supervisor.	Any metal chips are present or Class III oil leaks are found.
				b.	Clean and install drain cover (WP 0383 00). Remove gauge rod from housing and add OE/HDO oil (approximately 18 quarts) (17 liters). Check oil level and install gauge rod.	
	O.		O STANKE SULL CHECK WITH ENGIN	6 57 OF		
X		GAL	JGE ROD		Lb	
			*	J.		
				1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-		
					DRAIN COVER	
					HULL BOTTOM ACCESS COVERS	
				K		
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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				c. Clean differential oil filter and breather every 150 hours, 1500 miles (2414 km), or semi-annually, using cleaning compound.	
'		ľ	DIFFERENTIAL OIL FILTER		t
				BREATHER	
					# <u>C</u>
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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
78	Semi- Annual (M548A1)	1.2	Pivot Steer		
				Fire Resistant Hydraulic (FRH) fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on your skin, thoroughly wash with soap and water. Wash hands thoroughly prior to	
				eating or smoking. Application of these measures is considered an effective control of the hazard. CAUTION Use only FRH or OHA hydraulic fluid. Do not mix different types of hydraulic fluids. Do not overfill. NOTE If hydraulic fluid is contaminated, or fluid type is changed, drain pivot steer system, (WP 0371 00).	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		9		a. Remove fill plugs and check pivot steer master cylinders every 150 hours, 1500 miles or semi-annually. Add FRH as required to bring fluid within 1/2 to 3/4 inch from top of cylinder. For lubricant information, see (Table 13, page 0128 00-19).	
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ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	202000	EWMEMBER OCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
79	Semi- Annual (M548A1)	0.5	Transfer Gearcase Drain	a.	Drain gearcase oil. Drain only when hot after operation. Remove hull bottom access cover and drain cover (WP 0383 00). Inspect oil being drained for metal particles. If metal particles are found, notify your supervisor.	Any metal chips are present or Class III oil leaks are found.
				b.	Drain at least 15 minutes. Clean and install drain cover (WP 0383 00). Fill gearcase with approximately 2 1/2 quarts (2 liters) of OE/HDO oil. Make sure gearcase filler cap is closed and breather hole in gauge rod is open. Start engine (see your -10) and operate for one minute. Stop engine and check gearcase oil level. It should be between the gauge rod's FULL and ADD marks. Install hull bottom access cover securely (WP 0383 00). For lubricant information, see Table 6, page 0128 00-17.	
C	ADD SEST FULL 1 F	NAT BETWEEN M	MB3			L BOTTOM ESS COVERS
	GAUGE ROD					
	(Q)			DRA	IN COVER	-
				K		

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE
			SERVICES		IF:
80	Semi- Annual (M548A1)		Winch Power Takeoff Controls	a. Check winch power takeoff control for ease of operation and proper adjustment. Adjust as needed (WP 0414 00).	
				TAKEOFF CONTROL	
81	Semi- Annual	9	Decals, Instruction Plates, Stencils, and Paint	a. Replace unreadable decals, instruction plates, and stencil markings (WP 0440 00). Clean and paint bare spots on painted surfaces that might otherwise rust or corrode. See TB 43-0209.	
3				Coffode. See 1B 43-0209.	
82	Semi- Annual		Final Road Test	a. Perform final carrier road test. Drive carrier at least 5 miles (8 km).	
C				b. Ensure correction of operational faults. pay close attention to those items that were faulty to begin with.	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
83	Semi- Annual		Left and Right Steering	CAUTION Power plant can be damaged. Do not	
				pivot steer when carrier is moving except on a track failure emergency. a. Check steering in left and right turns. If carrier does not finish a complete turn, troubleshoot steering system (WP 0006 00).	Carrier does not turn properly.
84	Semi- Annual		Steering Forward and Reverse Range	a. Check steering in forward range and in reverse range. If carrier does not make a complete turn, troubleshoot steering system WP 0006 00.	Binding, grabbing, unusual noise, vibration, or carrier fails to turn.
85	Semi- Annual		Carrier Braking	a. Check carrier braking. If carrier does not stop when brakes are applied, troubleshoot brake system (WP 0068 00).	Carrier fails to stop.
86	Semi- Annual		Carrier Shifting in All Ranges	a. Check shifting of carrier in all ranges. If carrier does not respond properly to selected driving range, troubleshoot gear selection (WP 0006 00).	Carrier fails to shift into selected range.
87	Semi- Annual		After Road Test	a. Immediately after road test, cautiously feel all wheel and idler hubs for noticeable difference in temperature between hubs. An overheated hub indicates that bearing is out of adjustment, poorly lubricated, or unserviceable.	Any Class III leaks, cold shocks, or bad bearings.
				 Check temperature of shock absorbers. Shock absorbers should be warm. A cold shock absorber has failed, replace it (WP 0379 00). 	
				c. Visually check inside, outside, and underneath of carrier for fuel, oil, or hydraulic leaks.	Any Class III leak or fuel leak.

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
88	Semi- Annual		Idle Test	CAUTION Avoid lengthy engine idling. This causes coolant temperature to drop below operating temperature and can shorten engine life. NOTE After a successful road test, perform engine idle and governed no load test only. The stall check is not required unless engine or transmission discrepancies warrant additional fault isolation.	
		8		 a. Run engine at 800 to 1000 rpm for 3-5 minutes with range selector in 2-3 range and brakes locked until normal operating temperature is reached. b. If outside air temperature is less than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 200 degrees F (71 to 93 degrees C). If outside air temperature is greater than 85 degrees F (29 degrees C), normal operating temperature is greater than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 230 degrees E (71 to 110). 	Engine runs hot or rough.
				should be 160 to 230 degrees F (71 to 110 degrees C). c. With range selector in N (M548A1) or SL (M548A3), engine should idle smoothly at 650 to 700 rpm. d. High and low engine idle speed is usually caused by accelerator linkage being out of adjustment. Adjust linkage if necessary (WP 0197 00 or WP 0200 00). e. Rough idling is usually caused by faulty injector timing and rack setting, faulty injectors, or air in the injection system. Notify your supervisor.	

ITEM NO.	INTERVAL	MAN- HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
89	Semi- Annual		Governed No-Load Test	a. Run engine at 800 to 1000 rpm for 3-5 minutes with range selector in 2-3 range and brakes locked until normal engine operating temperature is reached.	
				b. If outside air temperature is less than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 200 degrees F (71 to 93 degrees C). If outside air temperature is greater than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 230 degrees F (71 to 110 degrees C).	
4				c. With range selector in N (M548A1) or SL (M548A3), slowly open throttle control until accelerator is fully depressed.	<
				CAUTION	
				When you suspect a faulty governor, do not exceed 3,000 rpm on engine for more than 2 or 3 seconds.	
			0	d. Engine speed may exceed 3,000 rpm momentarily, but should stabilize at 2,925 to 2,975 rpm.	If governor cuts in and out or surges at this speed, adjustments are needed. Notify your supervisor.

0128 00

The following list of parts are required when performing semi-annual, annual, or on-condition PMCS. The semiannual parts list contain the mandatory replacement parts for one semi-annual PMCS. The annual parts list contains the mandatory replacement parts for one semi-annual PMCS combined with the mandatory replacement parts for one (1) annual PMCS. The on-condition parts list contains replacement parts that are required when engine and transmission oil changes are directed by the Army Oil Analysis Program (AOAP) Laboratory. If AOAP Laboratory support is not available, change oil and filter elements/gasket every 150 hours/1500 miles or annually.

Table 17. SEMIANNUAL (1500 MILES)

Item No.	Part Number	NSN	Nomenclature	Qty
1	MS28778-12	5330-00-251-8839	PACKING	1

Table 18. ANNUAL (1500 MILES)

Item No.	Part Number	NSN	Nomenclature	Qty
1	MS28778-12	5330-00-251-8839	PACKING	1
2	IO874832	4730-00-766-4714	FILTER	1
3	MS28775-231	5330-00-527-7025	PACKING	1
4	5574161	5330-00-846-9841	GASKET	1
5	CW226MP	2910-00-287-1912	FILTER, ELEMENT	1
6	5574126	5330-00-612-3123	GASKET	1
7	1503536	5330-00-551-0433	GASKET	1
8	T552	2940-00-745-7730	FILTER, ELEMENT	1
9	5703232	2940-01-214-9303	PARTS KIT, FLUID PRE	1

Table 19. ON-CONDITION (1500 MILES)

Item No.	Part Number	NSN	Nomenclature	Qty
1	57023089	2940-00-678-0641	PARTS KIT	1
2	FL804FP	2940-01-197-7106	FILTER ELEMENT, FLUID	1
3	5703232	2940-01-214-9303	PARTS KIT, FLUID PRE	1
4	MS28775-231	5330-00-527-7025	PACKING	1
5	10874832	4730-00-766-4714	FILTER	1
6	MS35338-45	5310-00-407-9566	WASHER , LOCK	1



MULTIPLE PIN AND SOCKET IDENTIFICATION

0129 00

THIS WORK PACKAGE COVERS:

Inspection-Acceptance and Rejection Criteria (page 0129 00-1).

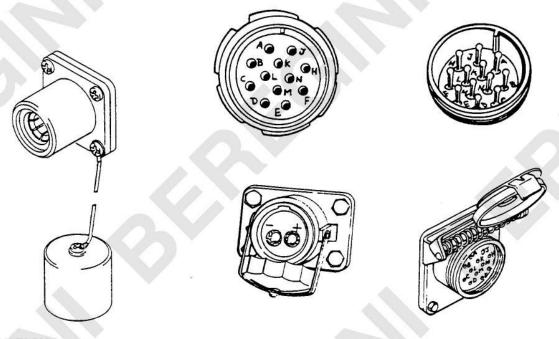
INITIAL SETUP:

Maintenance Level

Unit

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

- 1. It is important to identify the correct pins and sockets for repair when troubleshooting electrical connectors and receptacles.
- 2. Letters or other markings are stamped next to each pin and corresponding socket to ensure proper identification.
- 3. Following are examples of typical connectors found in carriers.



END OF TASK



Military Manuals Com - 20-1

CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS FOR ENGINE

WORK PACKAGE INDEX Title Sequence No. REMOVE/INSTALL POWER PLANT (M548A1)......0130 00 REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A3)......0139 00 REPLACE ENGINE OIL FILTER ELEMENT AND PARTS (M548A1)......0143 00



REMOVE/INSTALL POWER PLANT (M548A1)

0130 00

THIS WORK PACKAGE COVERS:

Removal (page 0130 00-2).

Inspection-Acceptance and Rejection Criteria (page 0130 00-14).

Installation page 0130 00-14.

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Beam Type Sling (WP 0541 00, Item 45)

Socket Wrench Set (WP 0541 00, Item 64)

Socket Wrench Set (WP 0541 00, Item 65)

Torque Wrench (WP 0541 00, Item 71)

Torque Wrench (WP 0541 00, Item 72)

Lifting device with rated lift capacity of at least 2500 lb

(1135 kg)

Materials/Parts

Antifreeze (WP 0542 00, Item 4)

Engine lubricating oil (WP 0542 00, Item 13)

GAA grease (WP 0542 00, Item 14)

Sealing compound (WP 0542 00, Item 37)

Gasket

Lock nut (2)

Suitable container

Washer (2)

Personnel Required

Unit mechanic

Helper (H)

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Both battery negative leads disconnected (WP 0292 00)

Neutral safety switch disconnected (WP 0308 00)

Machine gun mount kit removed, if equipped with

machine gun mount kit (WP 0513 00), (WP 0514 00), and (WP 0515 00)

Fabric and/or fiberglass cab covers and frame removed (WP 0418 00) and (WP 0456 00)

Top access cover and grilles removed (WP 0390 00)

Bulkhead protector removed, if equipped with material handling kit (WP 0487 00)

Power plant rear access door removed (see your -10)

Cab personnel seats removed (WP 0398 00)

Cab floor plates removed (WP 0394 00)

Hull bottom access cover removed (WP 0383 00)

Air cleaner container and element removed

(WP 0152 00)

Air cleaner hose disconnected from engine air intake

(WP 0153 00)

Air cleaner filter indicator removed (WP 0154 00)

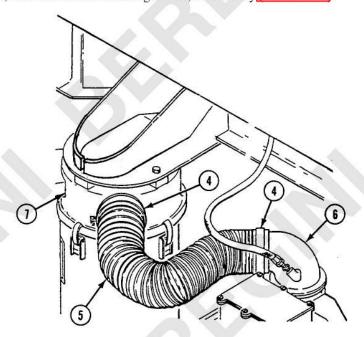
Air pump hose disconnected (WP 0191 00)

Transverse beam removed (WP 0384 00)

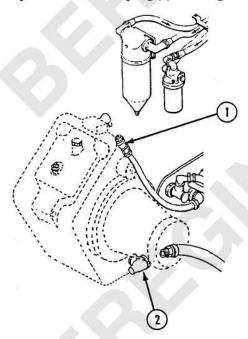
Cooling system drained (WP 0213 00)

REMOVAL

- 1. Loosen two clamps (4) that secure air cleaner hose (5) to air intake (6) and air cleaner head (7). Remove hose.
- 2. Drain oil from engine, transmission and transfer gearcase, if necessary (WP 0128 00).



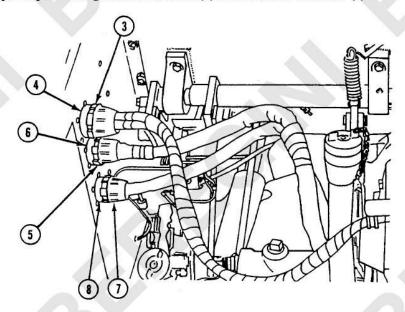
3. Disconnect differential oil hoses at quick-disconnect coupling (1) and at right angle gearbox (2).



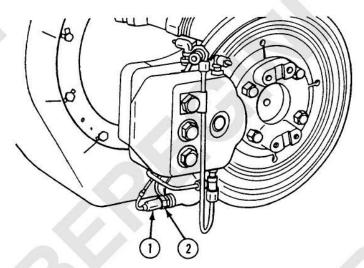
NOTE

Tag and identify electrical connectors and cables for installation.

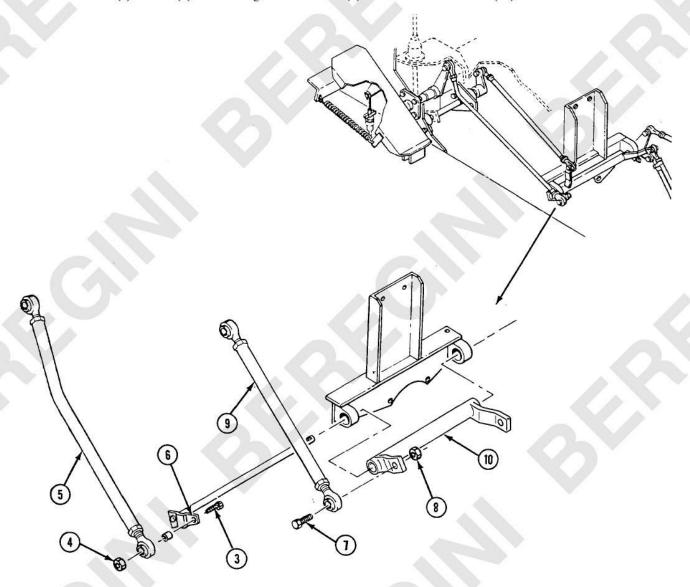
- 4. Disconnect power plant bulkhead connectors.
 - a. Disconnect regulator-to-bulkhead cable connector (3) from bulkhead connector (4).
 - b. Disconnect starter-to-bulkhead cable connector (5) from bulkhead connector (6).
 - c. Disconnect power plant wiring hamess connector (7) from bulkhead connector (8).



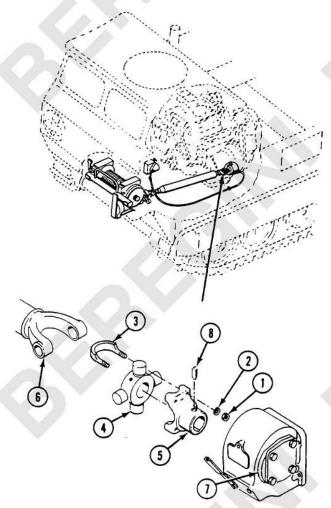
- 5. Disconnect differential oil high temperature switch circuit 328 lead (1) at connector (2).
- 6. Remove vehicle compartment heater duct (WP 0452 00), (WP 0453 00), or (WP 0454 00).



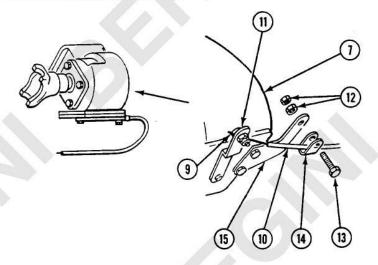
- 7. Remove screw (3) and nut (4) that secure accelerator pedal link (5) to inner cross shaft lever (6).
- 8. Remove screw (7) and nut (8) that secure gear selector link (9) at outer cross shaft lever (10).



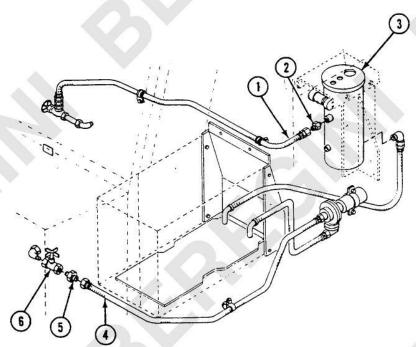
- 9. Disconnect winch propeller shaft from winch power takeoff.
 - a. Remove four nuts (1) and lock washers (2) that secure two U-bolts (3) and universal joint (4) to power takeoff yoke (5).
 - b. Remove propeller shaft (6) and universal joint (4) from power takeoff yoke (5) on power takeoff (7). Loosen setscrew (8) if needed.



- 10. Disconnect winch power takeoff control cable from winch power takeoff.
 - a. Loosen setscrew (9) that secures control cable (10) to actuating lever (11).
 - b. Remove two nuts (12), screw (13), and clamp (14) that secure control cable (10) to control bracket (15).
 - c. Remove control cable (10) from power takeoff (7).

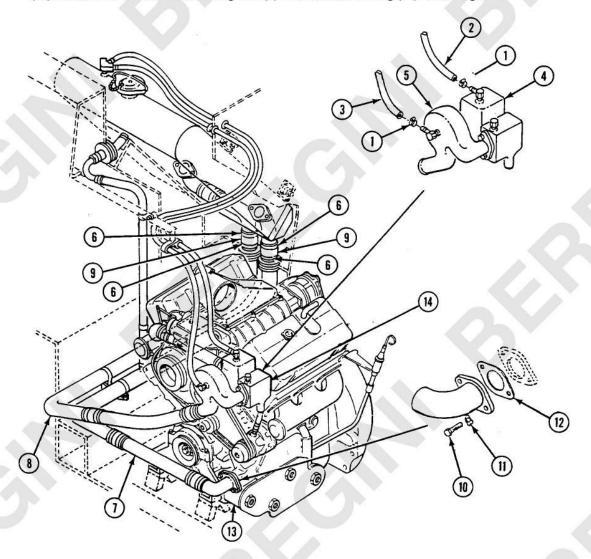


- 11. Remove transmission-to-differential propeller shaft (WP 0332 00).
- 12. If carrier is equipped with engine coolant heater kit, disconnect coolant hoses.
 - a. Unscrew heater-to-engine coolant hose (1) from nipple (2) at engine coolant heater (3).
 - b. Unscrew pump-to-engine outlet hose (4) from nipple (5) at engine outlet shutoff valve (6).

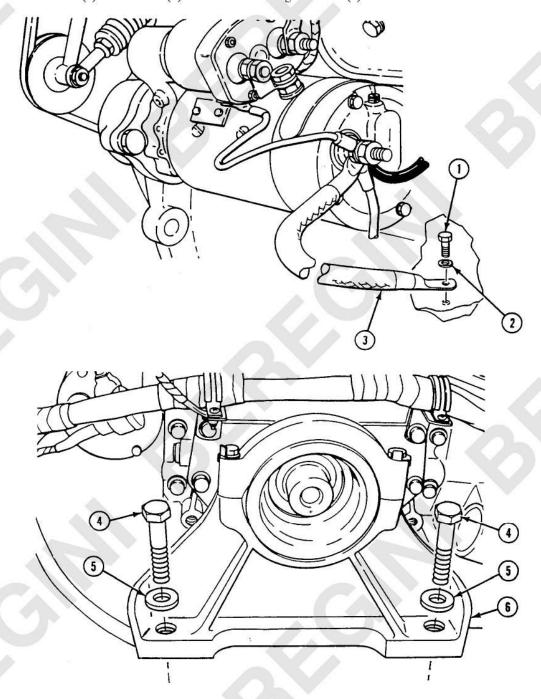


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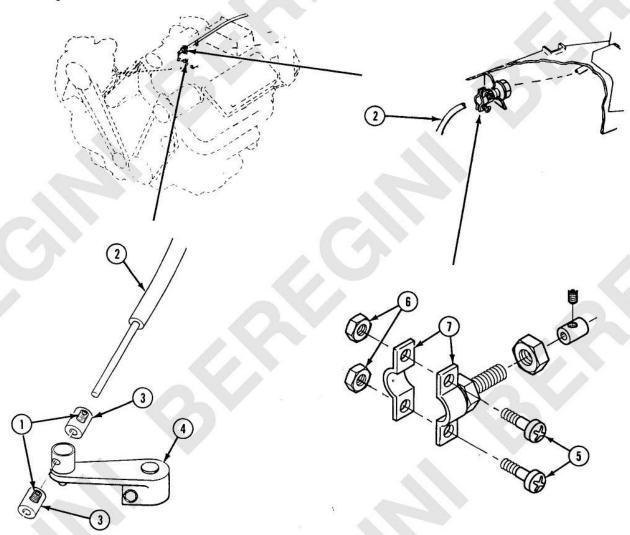
- 13. Disconnect radiator-to-thermostat housing coolant vent lines at thermostat housing.
 - a. Loosen two clamps (1) that secure coolant vent line (2) and coolant vent line (3) at thermostat housing (4) and deaeration elbow (5). Remove vent lines.
- 14. Remove radiator-to-oil cooler tube and radiator-to-thermostat housing coolant tube.
 - a. Loosen two hose clamps (6) that secure radiator-to-oil cooler tube (7) and radiator-to-thermostat housing tube (8) to two hoses (9).
 - b. Remove four screws (10), washers (11), and two gaskets (12) that secure radiator-to-oil cooler tube (7) to oil cooler (13) and radiator-to-thermostat housing tube (8) to thermostat housing (14). Discard gaskets.



- 15. Remove screw (1) and washer (2) that secure starter ground lead (3) to hull. Remove starter ground wire.
- 16. Remove two screws (4) and washers (5) that secure front engine mount (6) to hull. Discard washers.



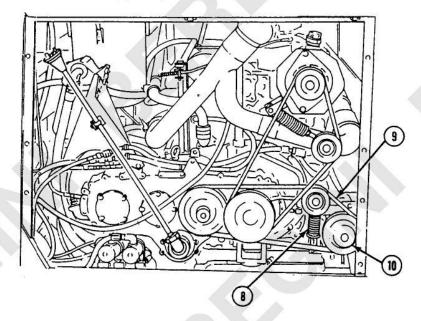
- 17. Remove fuel cutoff cable from power plant.
 - a. Loosen two setscrews (1) that secure control cable (2) in two collars (3) and stop lever (4).
 - b. Remove two screws (5) and lock nuts (6) that secure control cable (2) in clamp (7). Remove cable from power plant. Discard lock nuts.



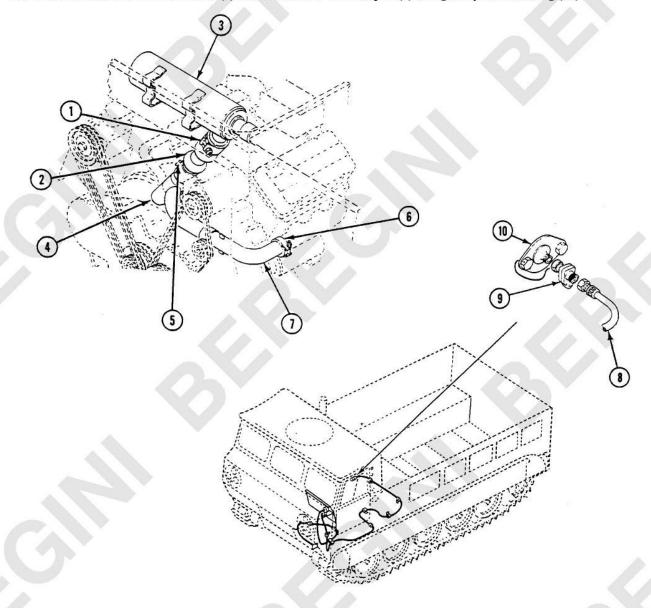
REMOVE/INSTALL POWER PLANT (M548A1) — Continued

0130 00

- 18. Remove rear fan drive belts from jackshaft pulley.
 - a. Loosen belt tension on belt adjuster (8).
 - b. Remove two rear fan drive belts (9) from jackshaft pulley (10).



- 19. Remove engine exhaust pipe from muffler and left crossover pipe.
 - a. Remove clamp (1) that secures exhaust pipe (2) to muffler (3).
 - b. Remove exhaust pipe (2) from muffler (3) and left crossover pipe (4). If needed, loosen clamp (5) on left crossover pipe and clamp (6) on right crossover pipe (7) to remove exhaust pipe.
- 20. Disconnect tachometer drive cable (8) from tachometer drive adapter (9) at engine flywheel housing (10).

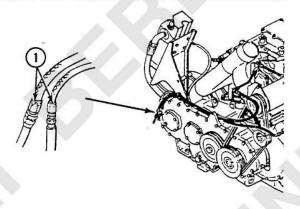


0130 00

NOTE

Tag and cover all fuel lines.

21. Disconnect two fuel lines at quick-disconnect couplings (1) at rear of power plant.



NOTE

Have helper assist with Steps 22 - 25.

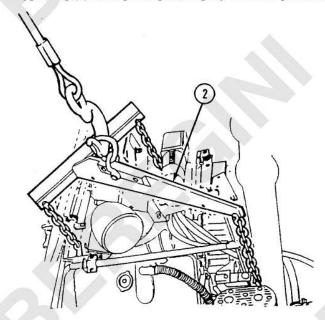
22. Attach beam type sling.

WARNING

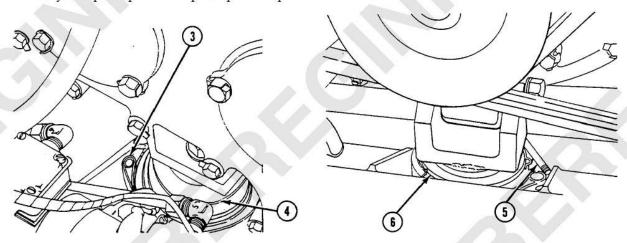


Make sure lifting device has rated lift capacity of at least 2500 lb (1135 kg) to safely raise the power plant. Keep all parts of body from under the suspended load.

23. Use lifting device and beam type sling (2) to lift power plant slightly to relieve pressure.



- 24. Remove transfer gearcase mounting clamps.
 - a. Remove mounting clamp (3) that secures left transfer gearcase mount (4) to hull.
 - b. Remove mounting clamp (5) that secures right transfer gearcase mount (6) to hull.
- 25. Carefully raise power plant out of power plant compartment.



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INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

CAUTION

Steam clean power plant only. Do not use cleaner or solvent which could damage rubber and plastic.

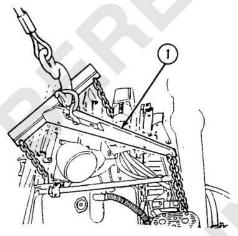
1. It tactical situation permits, steam clean power plant compartment. Make sure it is ready to receive power plant.

INSTALLATION



Make sure lifting device has rated lift capacity of at least 2500 lb (1135 kg) to safely raise the power plant. Keep all parts of body from under the suspended load.

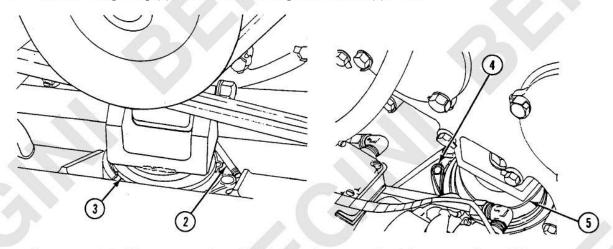
1. (H) Attach beam type sling (1) to lifting device. Slowly raise power plant and lower it into power plant compartment. Keep slight tension on sling.



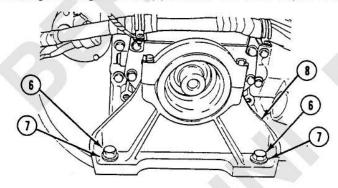
NOTE

Install mounting clamps so nuts are on inboard and forward sides of mounts.

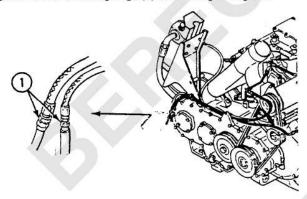
- Install transfer gearcase mounting clamps.
 - a. Install mounting clamp (2) to secure right transfer gearcase mount (3) to hull.
 - b. Install mounting clamp (4) to secure left transfer gearcase mount (5) to hull.



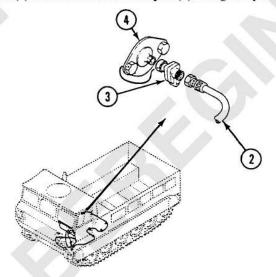
- 3. Install two screws (6) with two new washers (7) in front engine mount (8). Tighten screws finger tight.
- 4. (H) Lower beam type sling (1) and detach from power plant.
- 5. Tighten two screws (6) securing front engine mount (8) to hull to 120-130 lb-ft (163-176 N•m) torque.



6. Connect two fuel lines at quick-disconnect couplings (1) at rear of power plant.



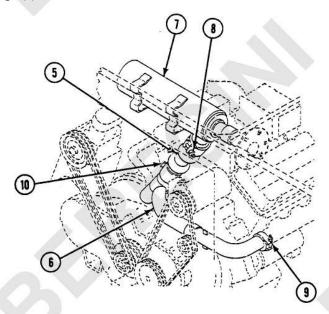
7. Connect tachometer drive cable (2) to tachometer drive adapter (3) at engine flywheel housing (4).



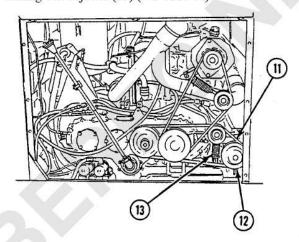
NOTE

Make sure ball sockets of exhaust pipe (5) are lined up with left crossover pipe (6) before you tighten clamps. This is to keep ball sockets from leaking exhaust gases.

- 8. Install engine exhaust pipe on muffler and left crossover pipe.
 - a. Install exhaust pipe (5) on left crossover pipe (6). Turn exhaust pipe install on ball joint to line up with muffler (7). Install clamp (8).
 - b. Tighten nut on clamp (8) to 200-220 lb-in (23-25 N·m) torque.
 - c. If needed, tighten nuts on clamp (9) and clamp (10) to 200-220 lb-in (23-25 (N•m) torque to secure exhaust pipe (5) to right crossover pipe (6).



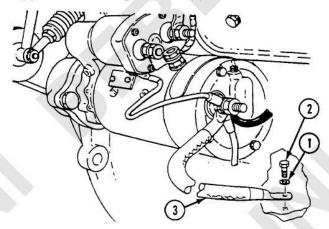
- 9. Install rear fan drive belts on jackshaft pulley.
 - a. Install two rear fan drive belts (11) on jackshaft pulley (12).
 - b. Adjust belt tension by turning belt adjuster (13) (WP 0226 00).



REMOVE/INSTALL POWER PLANT (M548A1) — Continued

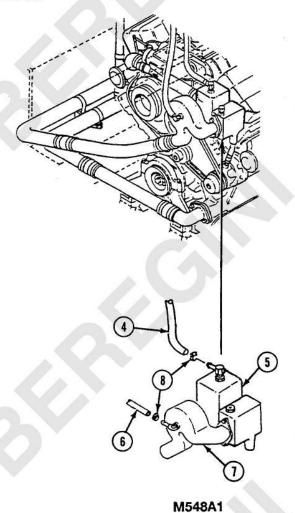
013000

- 10. Install fuel cutoff cable on power plant (WP 0205 00).
- 11. Adjust fuel cutoff hand control (WP 0195 00).
- 12. Install washer (1) and screw (2) to secure starter ground lead (3) to hull.



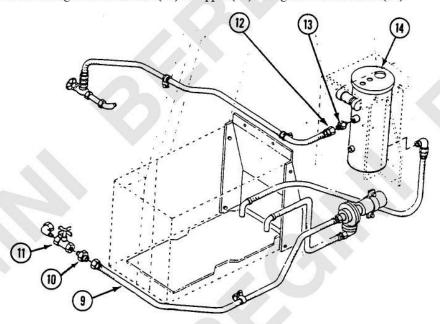
13. Install radiator-to-oil cooler tube and radiator-to-thermostat housing coolant tube (WP 0219 00).

- 14. Connect radiator-to-thermostat housing coolant vent lines at thermostat housing.
 - a. Install coolant vent line (4) on thermostat housing (5). Install coolant vent line (6) on deaeration elbow (7). Secure both lines with two clamps (8).

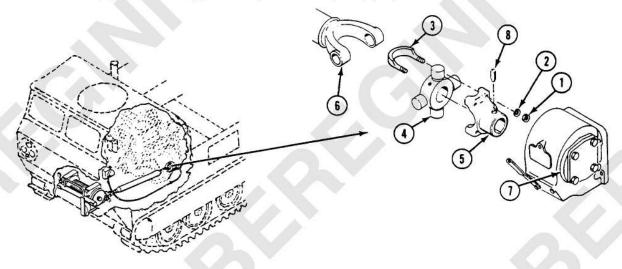


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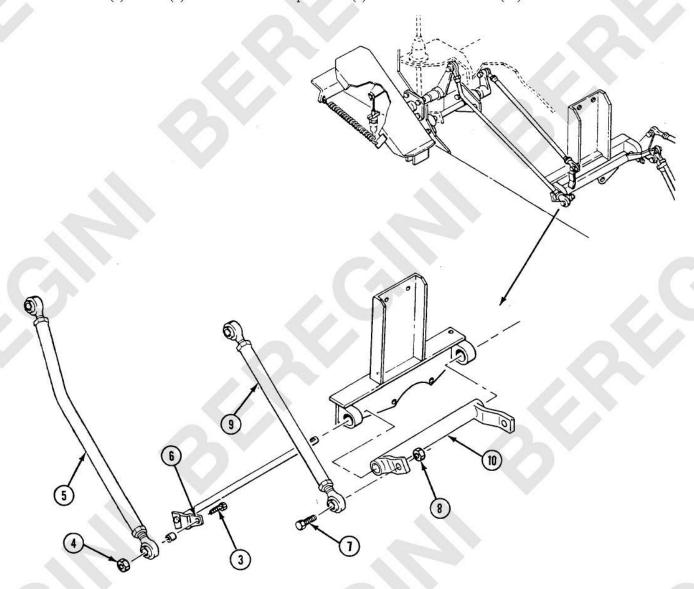
- 15. If carrier is equipped with engine coolant heater kit, connect coolant hoses.
 - a. Connect pump-to-engine outlet hose (9) to nipple (10) at engine outlet shutoff valve (11).
 - b. Connect heater-to-engine coolant hose (12) to nipple (13) at engine coolant heater (14).



- 16. Install transmission-to-differential propeller shaft (WP 0332 00).
- 17. Install winch power takeoff control cable to winch power takeoff (WP 0414 00).
- 18. Adjust winch control cable (WP 0414 00).
- 19. Connect winch propeller shaft to winch power takeoff.
 - a. Install four lock washers (1) and nuts (2) to secure two U-bolts (3) and universal joint (4) to power takeoff yoke (5). Tighten nuts to 169-200 lb-in (19-23 N•m) torque.
 - b. Install propeller shaft (6) and universal joint (4) on power takeoff yoke (5) on power takeoff (7).
 - c. If needed, tighten setscrew (8) to secure power takeoff yoke (5) to power takeoff (7).



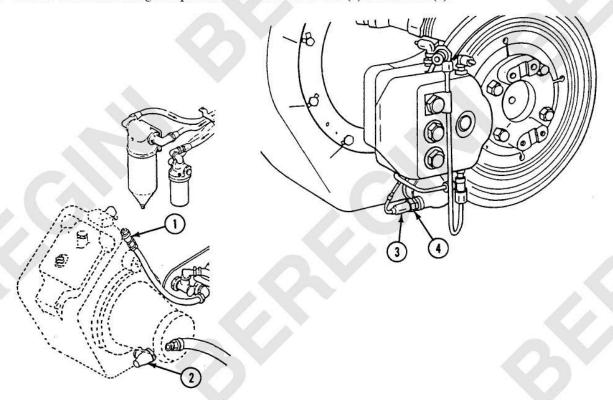
- 20. Install screw (3) and nut (4) to secure gear selector link (5) to outer cross shaft lever (6).
- 21. Install screw (7) and nut (8) to secure accelerator pedal link (9) to inner cross shaft lever (10).



CAUTION

Make sure differential oil hose quick disconnect coupling (1) is connected properly and secured. Connect coupling assemblies by aligning pin on body with groove on collar, pull back collar, and join two halves of quick disconnect. Release and rotate collar so pin does not align with groove.

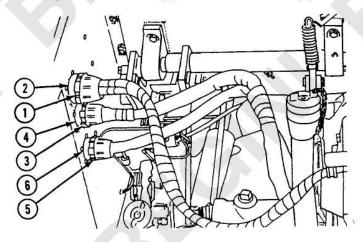
- 22. Connect differential oil hoses to quick disconnect coupling (1) on differential and to right angle gear box (2).
- 23. Connect differential oil high temperature switch circuit 328 lead (3) to connector (4).



NOTE

Use previously placed tags to identify cables and connectors.

- Connect power plant bulkhead cable connector to bulkhead connectors.
 - a. Connect regulator-to-bulkhead cable connector (1) to bulkhead connector (2).
 - b. Connect starter-to-bulkhead cable connector (3) to bulkhead connector (4).
 - c. Connect power plant wiring harness connector (5) to bulkhead connector (6).



- 25. Close all cooling system drain valves. Fill cooling system (WP 0212 00).
- 26. Install all oil drain plugs (engine, transmission, and transfer gearcase) and fill engine transmission and transfer gearbox with oil WP 0128 00.
- 27. Install air cleaner hose (WP 0153 00).

WARNING



Keep your hands, arms, and clothing away from rotating belts, pulleys, and shafts. Look, do not touch.

- 28. Start engine (see your -10).
- Check fan, generator, and air compressor drive belts for proper operation. Adjust drive belts if necessary (WP 0226 00) and (WP 0240 00).
- 30. Check power plant operation for fuel, oil, and coolant leaks and loose parts.
- 31. Stop engine (see your -10).

REMOVE/INSTALL POWER PLANT (M548A1) — Continued

0130 00

FOLLOW-THROUGH STEPS

- 1. Install transverse beam (WP 0384 00).
- 2. Install cab floor plates, door, and seat support (WP 0394 00).
- 3. Install cab personnel seats (WP 0398 00).
- 4. Connect air pump hose at pump (WP 0191 00).
- 5. Connect air cleaner indicator hose to engine air intake (WP 0153 00).
- 6. Install air cleaner container and element (WP 0152 00).
- 7. Install hull bottom access cover (WP 0383 00).
- 8. Lower center seat (see your -10).
- 9. Install power plant rear access door (see your -10).
- 10. Install bulkhead protector, if equipped with material handling kit (WP 0487 00).
- 11. Install top access cover and grilles (WP 0390 00)
- 12. Install fabric and/or fiberglass cab covers and frame (WP 0418 00) or (WP 0456 00).
- 13. Install machine gun mount kit, if required (WP 0513 00), (WP 0514 00), or (WP 0515 00).
- 14. Connect neutral safety switch (WP 0308 00).
- 15. Test neutral safety switch and adjust if necessary (WP 0308 00).
- 16. Connect battery negative lead (WP 0292 00).
- 17. Road test carrier (WP 0128 00).

END OF TASK

REMOVE/INSTALL POWER PLANT (M548A3)

0131 00

THIS WORK PACKAGE COVERS:

Removal (page 0131 00-1). Installation (page 0131 00-9).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Engine and Transmission Sling (WP 0541 00, Item 47) Torque Wrench (WP 0541 00, Item 68)

Lifting device with rated lift capacity of at least 3000 lb (1362 kg)

Materials/Parts

Antifreeze (WP 0542 00, Item 4)

Cotter pin (2)

Lock nut (2)

Lock nut (2)

Lock nut

Lock nut (4)

Lock washer

Lock washer (2)

Suitable containers

Personnel Required

Unit mechanic

Helper (H)

References

See your -10 See your PMCS

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Both battery negative leads disconnected (WP 0292 00)

Cab cover and frame removed (see your -10)

Rear compartment cover folded back or rear

compartment cover and bows removed (WP 0417 00)

Power plant rear access panel removed (see your -10)

Personnel seat and seat support removed (WP 0395 00),

(WP 0398 00)

Transverse beam removed (WP 0385 00)

Two center floor plates removed (WP 0395 00)

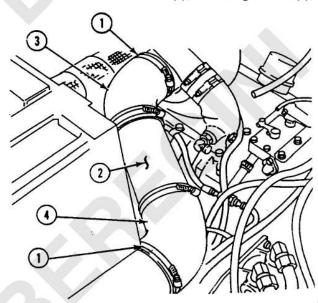
Support from seat support and floor support removed

(WP 0395 00)

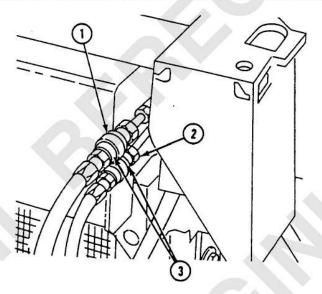
Muffler removed (WP 0207 00)

REMOVAL

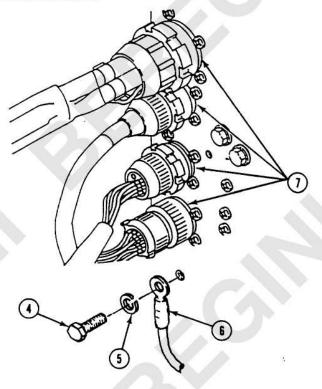
1. Loosen two clamps (1) and remove air filter-to-turbo hose (2), turbocharger outlet (3), and air cleaner outlet (4).



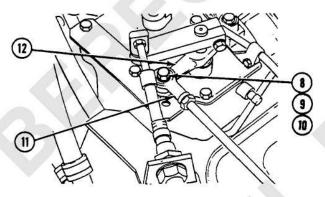
2. Disconnect engine fuel supply hose (1) and fuel return hose (2) from two quick disconnect couplings (3).



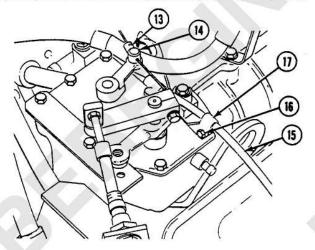
3. Remove screw (4), lock washer (5), ground lead (6), and four power plant wiring hamesses (7) from battery compartment bulkhead. Discard lock washer.



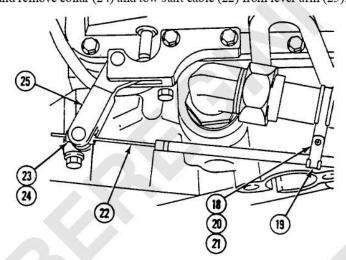
4. Remove lock nut (8), washer (9), screw (10), and throttle arm rod bearing (11) from governor lever arm (12). Discard lock nut.



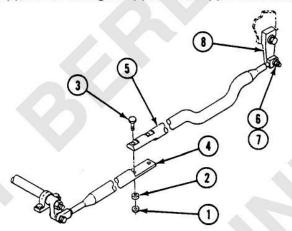
- 5. Loosen setscrew (13) and remove collar (14) from fuel cutoff cable (15).
- 6. Loosen clamp setscrew (16) and pull fuel cutoff cable (15) through guide clamp (17).



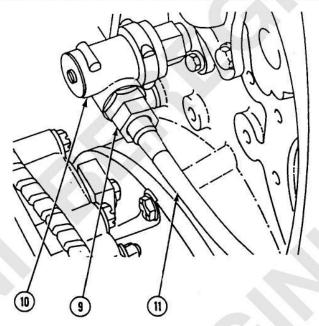
- 7. Remove screw (18), cable clamp (19), washer (20), and nut (21) from tow start cable (22).
- 8. Loosen setscrew (23) and remove collar (24) and tow start cable (22) from lever arm (25).



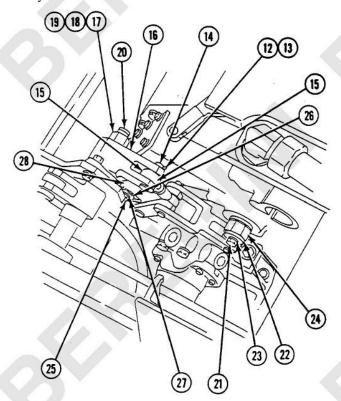
- 9. Remove two lock nuts (1), washers (2), and screws (3) and separate connecting link (4) and connecting link (5). Discard lock nuts.
- 10. Remove lock nut (6), washer (7), and connecting link (5) from lever (8). Discard lock nut.



11. Loosen tachometer cable nut (9) at engine right angle adapter (10) and remove tachometer cable (11).



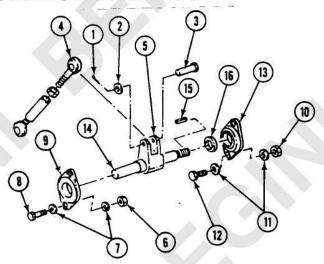
- 12. Remove cotter pin (12), washer (13), pin (14) and rod end (15) from connecting link (16). Discard cotter pin.
- 13. Remove lock nut (17), washer (18), link (16) and spacer (19) from shaft (20). Discard lock nut.
- 14. Remove screw (21), washer (22), and lock washer (23) from right brake arm (24). Discard lock washer.
- 15. Remove screw (25), washer (26), and lock washer (27) from left brake arm (28). Discard lock washer.
- 16. Remove brake linkage assembly from carrier.



REMOVE/INSTALL POWER PLANT (M548A3) — Continued

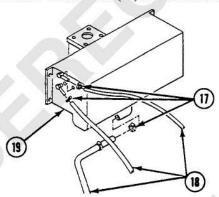
0131 00

- 17. Remove cotter pin (1), washer (2), pin (3), and rod bearing (4) from link (5). Discard cotter pin.
- 18. Remove two lock nuts (6), four washers (7), and two screws (8) from bearing (9). Discard lock nuts.
- 19. Remove two lock nuts (10), four washers (11) and two screws (12) from bearing (13). Discard lock nuts.
- 20. Remove shaft (14) with link (5), bearing (9), and bearing (13) from carrier.
- 21. Separate key (15), bearing (13), and spacer (16) from shaft (14).

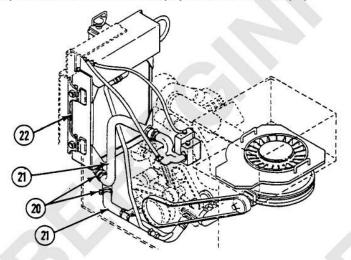


- 22. Remove two propeller shafts (WP 0335 00).
- 23. Remove hull bottom access cover (WP 0383 00).
- 24. Drain cooling system (WP 0213 00).

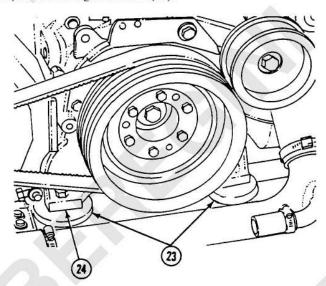
25. Loosen three clamps (17) and remove three coolant hoses (18) from radiator auxiliary tank (19).



26. Remove four clamps (20) and slide two coolant hoses (21) back from radiator (22).

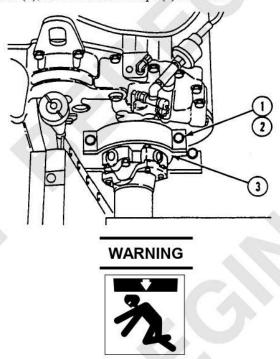


- 27. Remove cooling fan drive belt (WP 0227 00).
- 28. Remove two couplings (23) from rear engine mounts (24).



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29. Remove four screws (1), washers (2), and two trunnion caps (3) from hull.



Damaged lifting slings can fall with load. Personnel can be injured or killed. Inspect all slings. Do not use damaged slings.

30. Inspect sling for damage (WP 0443 00).



Lifting sling may slip and allow power plant to drop. Personnel may be injured. Be sure sling is firmly attached and maintains engine support.

CAUTION

Visually monitor power plant clearance at rear bulkhead to avoid damage to components.

- 31. Attach sling to power plant lifting points, making sure shackle is in hole stamped B.
- 32. Carefully remove power plant from carrier with hoist and place on blocks.

INSTALLATION



Damaged lifting slings can fall with load. Personnel can be injured or killed. Inspect all slings. Do not use damaged slings.

Inspect sling for damage (WP 0443 00).

CAUTION

Trunnion cap and spacer can get damaged. Make sure trunnion and spacer are positioned and installed correctly before you install mounting bolts.

NOTE

Make certain transmission aligning ring is installed in groove in lower half of right transmission mount or transmission trunnion.

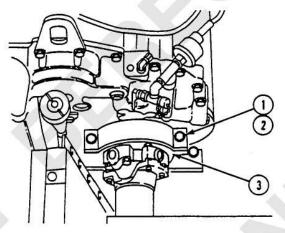
2. Attach sling to power plant lifting points, making sure shackle is in hole stamped B.



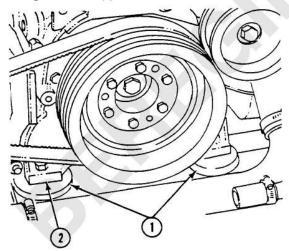
Lifting sling may slip and allow power plant to drop. Personnel may be injured. Be sure sling is firmly attached and maintains engine support.

3. Slowly lift and position power plant on its mounts inside carrier.

4. Install two trunnion caps (3), four washers (2) and screws (1) on hull. Tighten screws to 86-94 ft-lb (117-127 N•m) torque.

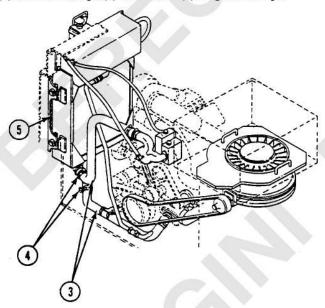


5. Install two couplings (1) on rear engine mounts (2).

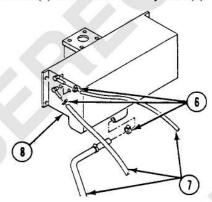


- 6. Remove lifting sling from power plant.
- 7. Install cooling fan drive belt (WP 0227 00)

8. Slide two coolant hoses (3) and four clamps (4) on radiator (5). Tighten clamps.

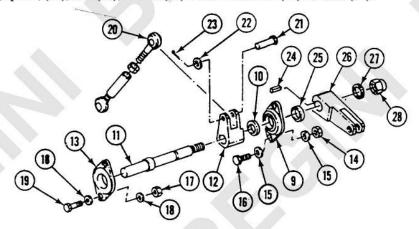


9. Install three clamps (6) and coolant hoses (7) on radiator auxiliary tank (8). Tighten clamps.

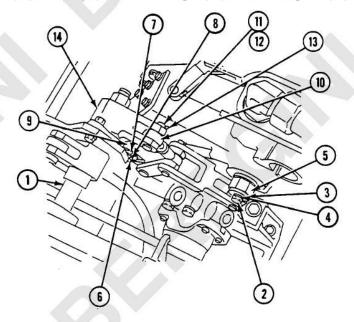


- 10. Service cooling system (WP 0214 00).
- 11. Install two propeller shafts (WP 0335 00).

- 12. Install bearing (9) and spacer (10) on shaft (11).
- 13. Install shaft (11) with link (12), bearing (9), and bearing (13) in carrier.
- 14. Install two new lock nuts (14), four washers (15), two screws (16) and bearing (9) on bulkhead.
- 15. Install two new lock nuts (17), four washers (18), two screws (19) and bearing (13) on bulkhead.
- 16. Install rod bearing (20), pin (21), washer (22) and new cotter pin (23) on link (12).
- 17. Install key (24), spacer, (25), link (26), washer (27) and new lock nut (28) on shaft (11).

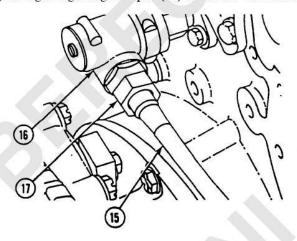


- 18. Position brake linkage assembly between brake arms on transmission and shaft (1).
- 19. Install screw (2), washer (3), new lock washer (4) and right brake arm (5) on transmission.
- 20. Install screw (6), washer (7), new lock washer (8) and left brake arm (9) on transmission.
- 21. Install rod end (10), pin (11), washer (12) and new cotter pin (13) on connecting link (14).

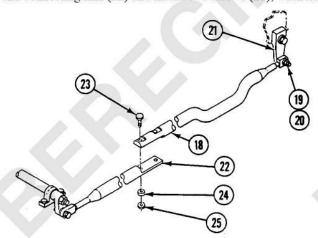


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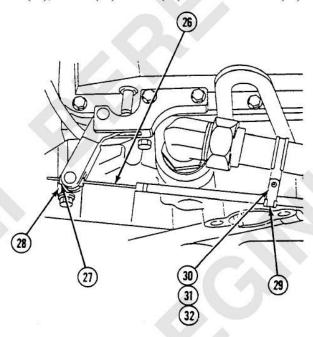
22. Install tachometer cable (15) on engine right angle adapter (16) and secure with tachometer cable nut (17).



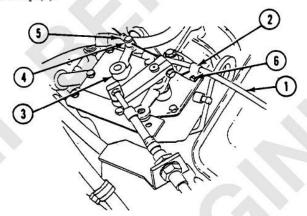
- 23. Install connecting link (18), washer (19), and new lock nut (20) on lever (21).
- 24. Join connecting link (18) and connecting link (22) and install two screws (23), washers (24) and new lock nuts (25).



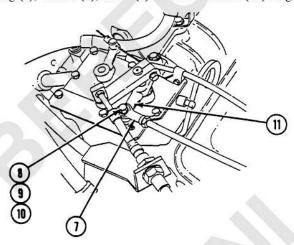
- 25. Install tow start cable (26) in collar (27). Tighten setscrew (28).
- 26. Install cable clamp (29), screw (30), washer (31) and nut (32) on tow start cable (26).



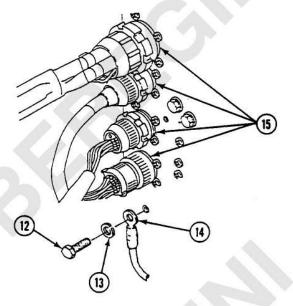
- 27. Push fuel cutoff cable (1) through guide clamp (2) and install in fuel cutoff lever (3).
- 28. Install collar (4) on fuel cutoff cable (1) and tighten setscrew (5).
- 29. Tighten screw (6) on guide clamp (2).



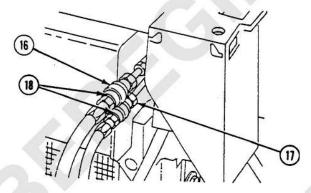
30. Install throttle arm rod bearing (7), washer (8), screw (9) and new lock nut (10) on governor lever arm (11).



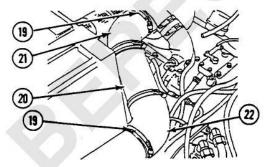
31. Install screw (12), new lock washer (13), ground lead (14), and four power plant wiring hamesses (15) on battery compartment bulkhead.



32. Connect engine fuel supply hose (16) and fuel return hose (17) to two quick disconnect couplings (18).



33. Install two clamps (19) and air filter-to-turbo hose (20) on turbocharger outlet (21) and air cleaner outlet (22). Tighten clamps.



FOLLOW-THROUGH STEPS

- 1. Install hull bottom access cover (WP 0383 00).
- 2. Install muffler (WP 0207 00).
- 3. Install support from seat support and floor support (WP 0395 00).
- 4. Install two center floor plates (WP 0395 00).
- 5. Install transverse beam (WP 0385 00).
- 6. Install personnel seat and seat support (WP 0395 00), (WP 0398 00).
- 7. Unfold rear compartment cover forward or install rear compartment cover and bows (WP 0417 00).
- 8. Install cab cover and frame (see your -10)
- 9. Adjust throttle valve modulator (WP 0204 00).
- 10. Check engine and transmission fluid levels (see your PMCS).
- 11. Connect both battery negative leads (WP 0292 00)
- 12. Start engine (see your -10). Check for leaks.
- 13. Stop engine (see your -10).
- 14. Install power plant rear access panel (see your -10).

END OF TASK

BLOCK POWER PLANT (M548A1)

0132 00

THIS WORK PACKAGE COVERS:

Block (page 0132 00-1).

INITIAL SETUP:

Maintenance Level

Equipment Condition

Unit

Power plant removed from carrier WP 0130 00

Materials/Parts

Wood block (as necessary)

Personnel Required

Unit Mechanic

Helper (H)

JACKING

BLOCK POWER PLANT

WARNING



You could get hurt if power plant is not blocked to prevent sudden movement. Block power plant as shown before you attempt any disassembly.

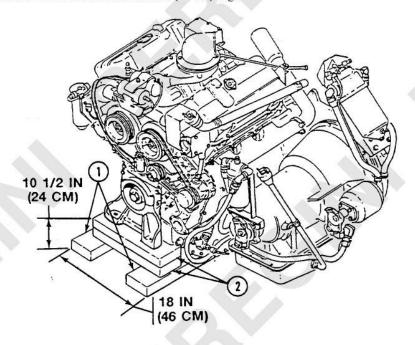
WARNING



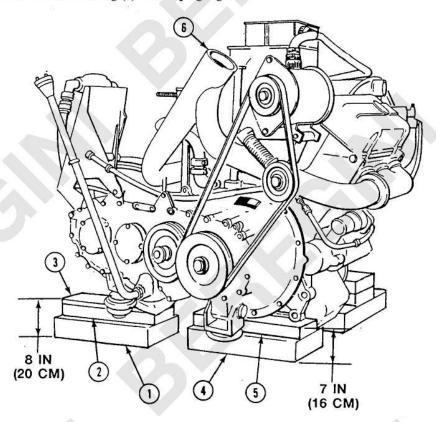
Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment while power unit is being removed or installed.

1. Use a lifting device of at least 2,500 lb (1,135 kg) capacity and sling to lift power plant. Have helper assist.

- 2. On level ground place two 4 x 6 x 18 inch (10 x 15 x 46 cm) blocks (1) under front of engine. Place blocks parallel to each other with 6 inch (15 cm) side down. Blocks should be about 18 inches (46 cm) apart from outside edges.
- 3. Stack two 4 x 6 x 18 inch (10 x 15 x 46 cm) blocks (2) on top of each other. Place blocks on top of blocks (1) at a 90 degree angle. Blocks will be about 10 1/2 inches (24 cm) high.



- 4. Stack a 4 x 6 x 10 inch (10 x 15 x 25 cm) block (1), a 2 x 4 x 10 inch (5 x 10 x 25 cm) block (2), and a 1 x 4 x 10 inch (3 x 10 x 25 cm) block (3) under transmission side of transfer gearcase. Blocks should be 8 inches (20 cm) high.
- 5. Stack a 4 x 6 x 18 inch (10 x 15 x 46 cm) block (4) and a 2 x 4 x 18 inch (5 x 10 x 46 cm) block (5) under rear of engine. Blocks should be about 7 inches (16 cm) high.
- Lower power plant slowly down onto blocks. Check that power plant is firmly supported by the blocks.
- 7. Cover air inlet housing (6). Use wiping rag.



FOLLOW-THROUGH STEPS

1. Install power plant in carrier (WP 0130 00).

END OF TASK



BLOCK POWER PLANT (M548A3)

0133 00

THIS WORK PACKAGE COVERS:

Block (page 0133 00-1).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57) Engine and Transmission Sling (WP 0541 00, Item 47) Lifting device with rated lift capacity of at least 3000 lb (1362 kg) capacity

Materials/Parts

All blocks are made from surfaced dimensioned lumber. Dimensions are in inches with metric equivalents. Lumber 4 x 6 x 40 inch (10 x 15 x 102 cm)

Lumber 4 x 6 x 20 inch (10 x 15 x 51 cm)

Personnel Required

Unit Mechanic Helper (H)

Equipment Condition

Power plant removed WP 0131 00

JACKING

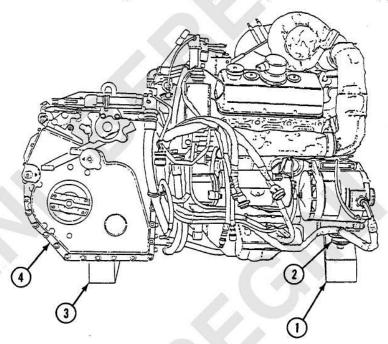
BLOCK POWER PLANT



Blocking power plant on unlevel, soft ground can cause power plant to sink and tip over. Personnel can be injured and power plant can be damaged. Make sure to block power plant on flat, hard ground.

1. Use a lifting device of at least 3000 lb (1362 kg) capacity and engine and transmission sling to lift power plant.

- 2. On level ground, place a 4 x 6 x 40 inch (10 x 15 x 102 cm) block (1) under motor mounts of engine (2).
- 3. On level ground, place two 4 x 6 x 20 inch (10 x 15 x 52 cm) blocks (3) under transmission (4).



- 4. Lower power plant down slowly onto blocks. Have helper assist.
- 5. Check that power plant is firmly supported by blocks.

REPLACE AIR BOX DRAIN AND CRANKCASE BREATHER COLLECTOR CAN

0134 00

THIS WORK PACKAGE COVERS:

Removal (page 0134 00-1). Installation (page 0134 00-1).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

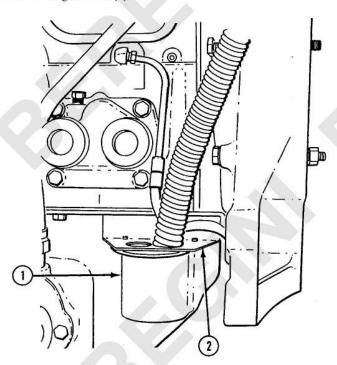
Carrier blocked (see your -10)

Battery ground lead(s) disconnected (WP 0292 00)

Hull bottom access cover removed (WP 0383 00)

REMOVAL

- 1. Turn collector can (1) to the left.
- 2. Remove collector can from mounting bracket (2).



INSTALLATION

- 1. Place collector can (1) on mounting bracket (2).
- 2. Secure collector can (1) by turning it to the right.

TM 9-2350-247-20-1

REPLACE AIR BOX DRAIN AND CRANKCASE BREATHER COLLECTOR CAN — Continued

0134 00

FOLLOW-THROUGH STEPS

- 1. Connect battery negative lead(s) (WP 0292 00).
- 2. Start engine (see your -10).
- 3. Check air box drain and crankcase breather collector can for proper operation.
- 4. Stop engine (see your -10).
- 5. Install hull bottom access cover (WP 0383 00).

REPLACE AIR BOX DRAIN TUBES (M548A1)

0135 00

THIS WORK PACKAGE COVERS:

Removal (page 0135 00-1). Installation (page 0135 00-1).

INITIAL SETUP:

Maintenance Level

Unit

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Tools and Special Tools

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

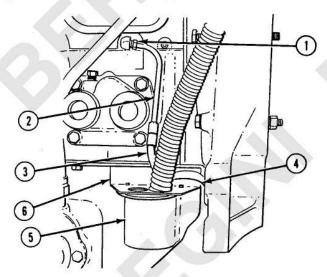
Carrier blocked (see your -10)

Battery ground lead disconnected (WP 0292 00)

Hull bottom access cover removed (WP 0383 00)

REMOVAL

- 1. Loosen two nuts (1) that secure two drain tubes (2) to each side of engine.
- Loosen three clamps (3) that secure hose (4) between right drain tube (2) and collector can (5).
- 3. Remove two drain tubes (2) from air box. Remove hose (4) from crankcase breather collector can (5) through bracket (6).



INSTALLATION

- 1. Place drain tube (2), with hose (4), on each side of engine. Secure with three clamps (3) and two nuts (1).
- 2. Place ends of drain hose (4) through collector can (5) and bracket (6) into collector can.

REPLACE AIR BOX DRAIN TUBES (M548A1) — Continued

0135 00

FOLLOW-THROUGH STEPS

- 1. Connect battery negative lead (WP 0292 00).
- 2. Start engine (see your -10).
- 3. Check air box drain tubes for proper operation.
- 4. Stop engine (see your -10).
- 5. Install hull bottom access cover (WP 0383 00).

REPLACE AIR BOX DRAIN CHECK VALVE AND TUBES (M548A3)

0136 00

THIS WORK PACKAGE COVERS:

Removal (page 0136 00-1). Installation (page 0136 00-3).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Lock washer

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Both battery negative leads disconnected (WP 0292 00)

Hull bottom access cover removed (WP 0383 00)

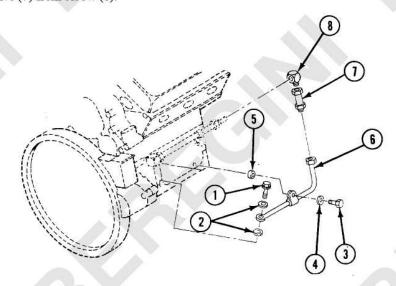
Air cleaner assembly removed (WP 0159 00)

Center seat raised (see your -10)

REMOVAL

Left side

- 1. Remove adapter (1) and two washers (2) from engine.
- 2. Remove bolt (3), lock washer (4), and spacer (5) from engine. Discard lock washer.
- 3. Remove tube assembly (6) from check valve (7).
- 4. Remove check valve (7) from elbow (8).

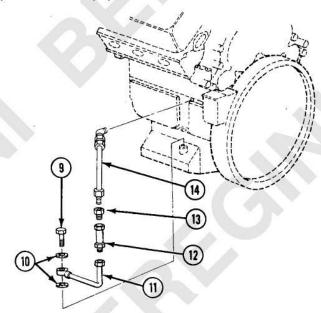


REPLACE AIR BOX DRAIN CHECK VALVE AND TUBES (M548A3) — Continued

0136 00

Right side

- 5. Remove adapter (9) and two washers (10) from engine.
- 6. Remove tube assembly (11) from check valve (12).
- 7. Remove check valve (12) and connector (13) from tube assembly (14).
- 8. Remove check valve (12) from connector (13).



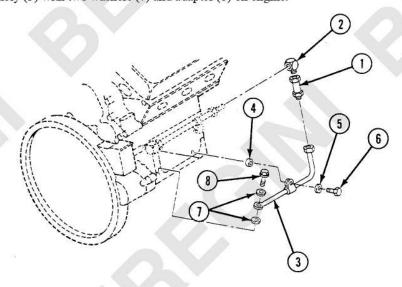
REPLACE AIR BOX DRAIN CHECK VALVE AND TUBES (M548A3) — Continued

0136 00

INSTALLATION

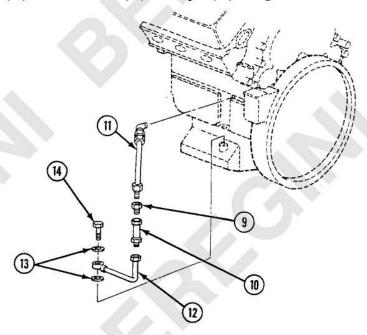
Left side

- 1. Install check valve (1) on elbow (2).
- 2. Install tube assembly (3) on check valve (1).
- 3. Install tube assembly (3) with spacer (4), new lock washer (5), and bolt (6) on engine.
- 4. Install tube assembly (3) with two washers (7) and adapter (8) on engine.



Right side

- 5. Install connector (9) on check valve (10).
- 6. Install connector (9) and check valve (10) on tube assembly (11).
- 7. Install tube assembly (12) on check valve (10).
- 8. Install tube assembly (12) with two washers (13) and adapter (14) on engine.



FOLLOW-THROUGH STEPS

- 1. Install air cleaner assembly (WP 0159 00).
- 2. Install hull bottom access cover (WP 0383 00).
- 3. Connect both battery negative leads (WP 0292 00).
- 4. Lower center seat (see your -10).

REPLACE ENGINE CRANKCASE BREATHER HOSE

0137 00

THIS WORK PACKAGE COVERS:

Removal (page 0137 00-1). Installation (page 0137 00-2).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

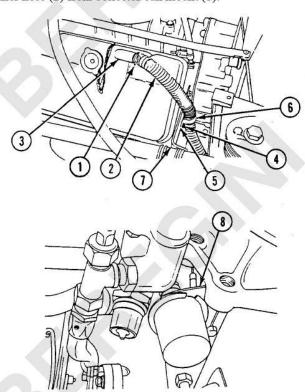
Engine stopped (see your -10) Carrier blocked (see your -10)

Battery ground lead(s) disconnected (WP 0292 00) Top access cover and grilles removed (WP 0390 00)

Hull bottom access cover removed (WP 0383 00)

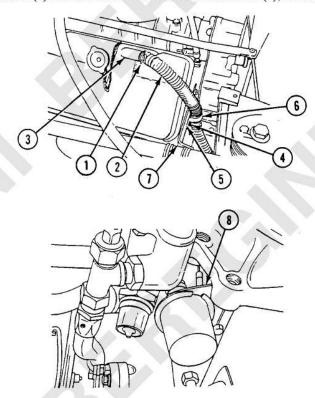
REMOVAL

- 1. Remove hose clamp (1) that secures breather hose (2) to valve cover ventilation outlet (3).
- 2. Remove two screws (4), washers (5), and clamps (6) from bracket (7).
- 3. Remove other end of breather hose (2) from collector can mount (8).



INSTALLATION

- 1. Place breather hose (2) on valve cover ventilation outlet (3).
- 2. Install other end of breather hose through collector can mount (8).
- 3. Place breather hose on bracket (7). Secure hose to bracket with two screws (4), washers (5), and clamps (6).



FOLLOW-THROUGH STEPS

- 1. Connect battery negative lead(s) (WP 0292 00).
- 2. Start engine (see your -10).
- 3. Check crankcase breather hose for proper operation.
- 4. Stop engine (see your -10).
- 5. Install top access cover and grilles (WP 0390 00).
- 6. Install hull bottom access cover (WP 0383 00).

REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A1)

0138 00

THIS WORK PACKAGE COVERS:

Removal (page 0138 00-1). Installation (page 0138 00-2).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

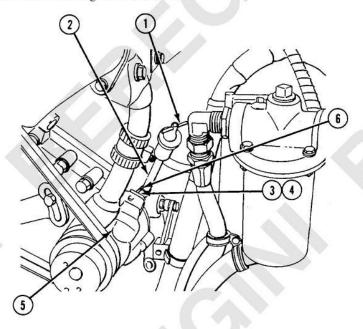
Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat raised (see your -10)

REMOVAL

- 1. Turn gauge rod handle (1) to the left to release. Lift gauge rod from tube (2).
- 2. Remove screw (3) that secures clamp (4) to coolant pump (5). Remove clamp.
- 3. Unscrew nut (6) that secures tube to engine. Remove tube.

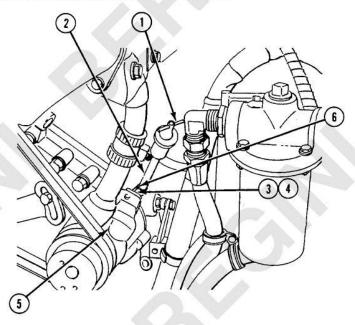


REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A1) — Continued

0138 00

INSTALLATION

- 1. Place tube (2) on engine. Secure with nut (6).
- 2. Place clamp (4) on tube on coolant pump (5). Secure with screw (3).
- 3. Insert gauge rod (1) in tube and turn gauge rod handle to the right.



FOLLOW-THROUGH STEPS

Lower center seat (see your -10).

REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A3)

0139 00

THIS WORK PACKAGE COVERS:

Removal (page 0139 00-2). Installation page 0139 00-3).

INITIAL SETUP:

Maintenance Level References

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Adhesive (WP 0542 00, Item 1)

Self-locking screw

Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Both battery negative leads disconnected (WP 0292 00)

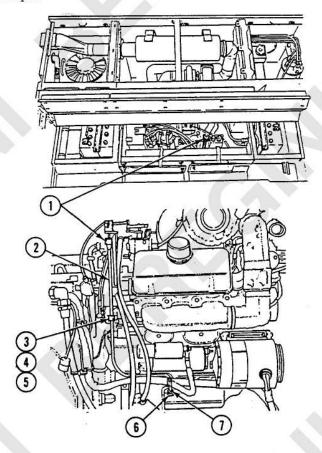
Center seat raised (see your -10)

REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A3) — Continued

013900

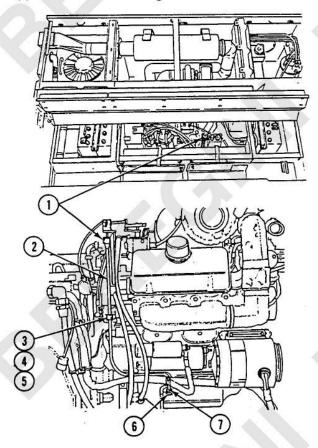
REMOVAL

- 1. Turn gauge rod (1) counterclockwise and remove from tube (2).
- 2. Remove self-locking screw (3), washer (4), and clamp (5) from engine. Remove clamp (5) from tube (2). Discard self-locking screw.
- 3. Loosen nut (6) and remove tube (2) from adapter (7).
- 4. Remove adapter (7) from oil pan.



INSTALLATION

- 1. Apply a thin coat of adhesive to external threads of adapter (7).
- 2. Install adapter (7) in oil pan.
- 3. Install tube (2) on adapter (7) and tighten nut (6).
- 4. Install clamp (5) on tube (2). Secure clamp and tube to engine with new self-locking screw (3) and washer (4).
- 5. Install gauge rod (1) in tube (2) and turn clockwise to tighten.



FOLLOW-THROUGH STEPS

- Connect both battery negative leads (WP 0292 00).
- 2. Lower center seat (see your -10).



REPLACE ENGINE OIL FILLER CAP AND TUBE

0140 00

THIS WORK PACKAGE COVERS:

Removal (page 0140 00-2). Installation (page 0140 00-5).

INITIAL SETUP:

Maintenance Level References

Unit See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Gasket Screws (2)

Washers (2) Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)

Power plant rear access door/panel removed

(see your -10)

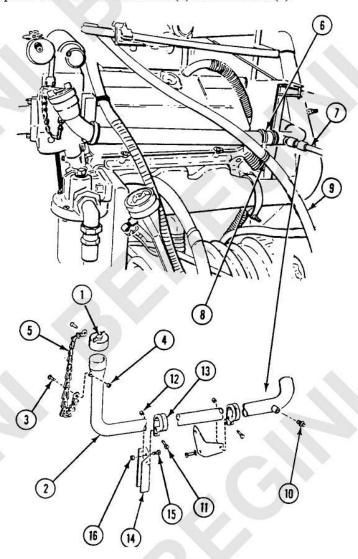
REMOVAL

- 1. Turn cap (1) left to release. Lift cap from filler tube (2).
- 2. Remove screw (3), nut (4), and cap retaining chain (5) from filler tube (2). Remove cap (1) with chain.

NOTE

If your carrier has an air compressor, do Step 3 and Step 4.

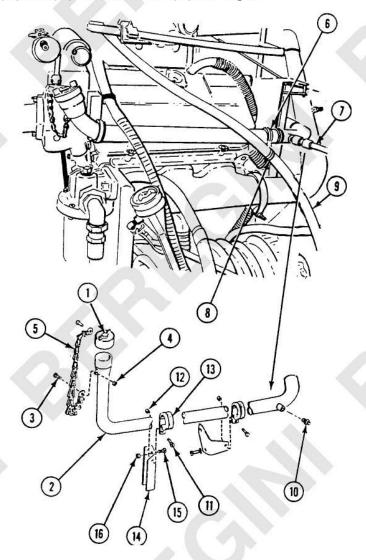
- 3. Remove clamp (6). Separate compressor outlet hose (7) from adapter. Remove adapter from filler tube (2).
- 4. Remove clamp (8). Separate coolant heater outlet hose (9) from filler tube (2).



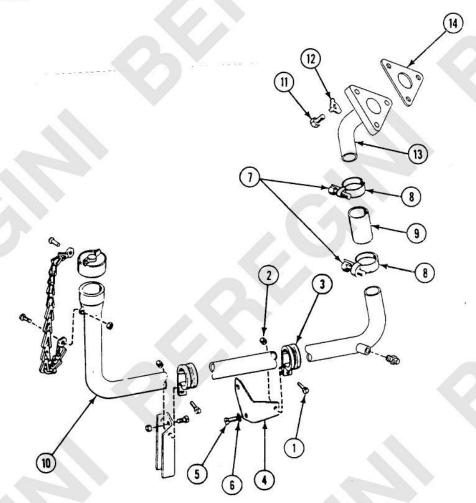
NOTE

If your carrier does not have an air compressor do Step 5.

- 5. Remove pipe plug (10) from filler tube (2).
- 6. Remove screw (11), nut (12), and clamp (13) from front bracket (14).
- 7. Remove two screws (15), nuts (16), and front bracket (14) from engine.

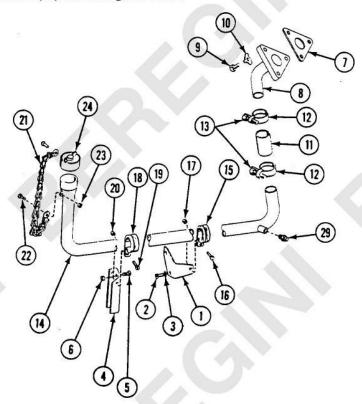


- 8. Remove screw (1), nut (2), and clamp (3) from rear bracket (4).
- 9. Remove two screws (5), washers (6), and rear bracket (4) from engine. Discard screws and washers.
- 10. Remove two screws (7) and clamps (8) from hose (9). Remove filler tube (10) from hose (9).
- 11. Remove three screws (11), and washers (12), from elbow (13), and gasket (14) from engine. Separate elbow from gasket. Discard gasket.



INSTALLATION

- 1. Install rear bracket (1) on engine with two new screws (2) and washers (3).
- 2. Install front bracket (4) on engine with two screws (5) and nuts (6).
- 3. Install new gasket (7) and elbow (8) on engine with three screws (9) and washers (10).
- 4. Install hose (11) on elbow (8) with clamp (12) and screw (13).
- 5. Install filler tube (14) on hose (11) with clamp (12) and screw (13).
- 6. Secure filler tube (14) to rear bracket (1) with clamp (15), screw (16), and nut (17).
- 7. Secure filler tube (14) to front bracket (4) with clamp (18), screw (19), and nut (20).
- 8. Install caps retaining chain (21) on filler tube (14) with screw (22) and nut (23).
- 9. Place cap (24) on filler tube (14) and turn right to secure.



NOTE

If your carrier has an air compressor, do Step 10 and Step 11.

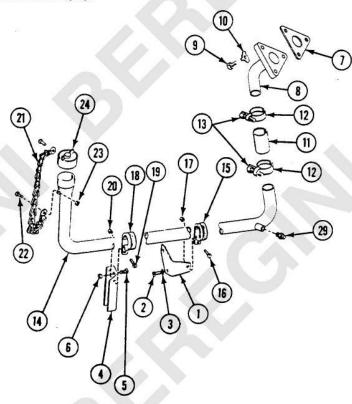
- 10. Install compressor outlet hose (25) to filler tube (14) with clamp (26).
- 11. Install coolant heater outlet hose (27) to filler tube (14) with clamp (28).

0140 00

NOTE

If your carrier does not have an air compressor, do Step 12.

12. Install pipe plug (29) in filler tube (14).



FOLLOW-THROUGH STEPS

- 1. Lower center seat (see your -10).
- Install power plant rear access door/panel (see your -10).

REPLACE ENGINE OIL FILTER HOSES (M548A1)

0141 00

THIS WORK PACKAGE COVERS:

Removal (page 0141 00-2). Cleaning (page 0141 00-3). Installation (page 0141 00-4).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Antiseize compound (WP 0542 00, Item 6) Cleaning compound (WP 0542 00, Item 9) Sealing compound (WP 0542 00, Item 37)

Engine oil WP 0128 00)
Self-locking nut (2)
Suitable container

Personnel Required

Unit Mechanic

References

See your -10

Standard Operating Procedures

Equipment Condition

Engine stopped (see your -10)

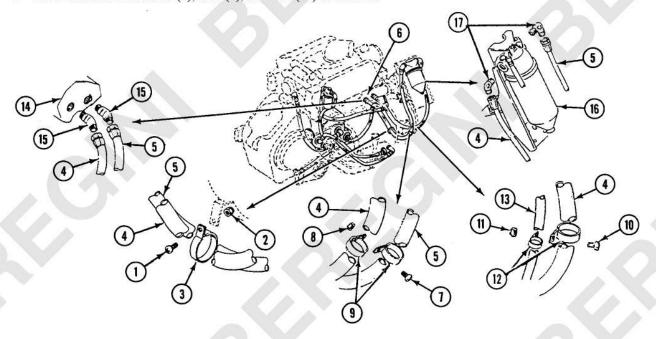
Carrier blocked (see your -10)

Battery ground lead disconnected (WP 0292 00) Hull bottom access cover removed (WP 0383 00)

Power plant rear access door removed (see your -10)

REMOVAL

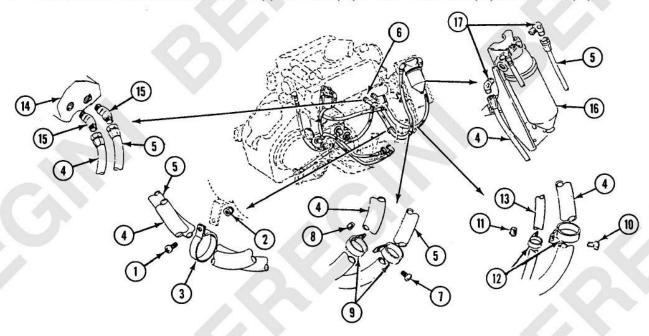
- 1. Remove screw (1) and nut (2). Remove clamp (3) that secures engine oil filter hose (4) and engine oil filter hose (5) to power plant (6).
- 2. Remove screw (7) and nut (8). Remove two clamps (9) that secure oil filter hose (4) and oil filter hose (5) to power plant (6).
- 3. Remove two screws (10), lock nuts (11), and clamps (12) from oil filter hose (4) and AOAP hose (13). Discard lock nuts.
- 4. Place container under hose (4), hose (5), and hose (13) to catch oil.



NOTE

Dispose of engine oil in accordance with Standard Operating Procedures.

- 5. Disconnect oil filter hose (4) and oil filter hose (5) at engine block (14). Hold hoses down to let oil drain.
- 6. Remove two elbows (15) from engine block (14).
- 7. Disconnect oil filter hose and oil filter hose (5) at oil filter (16). Remove two elbows (17) from oil filter (16).

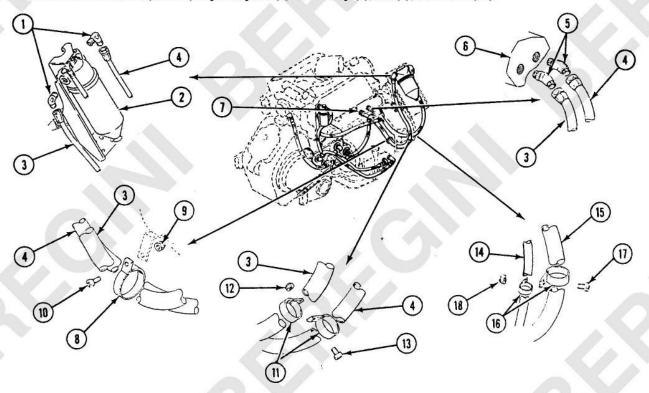


CLEANING

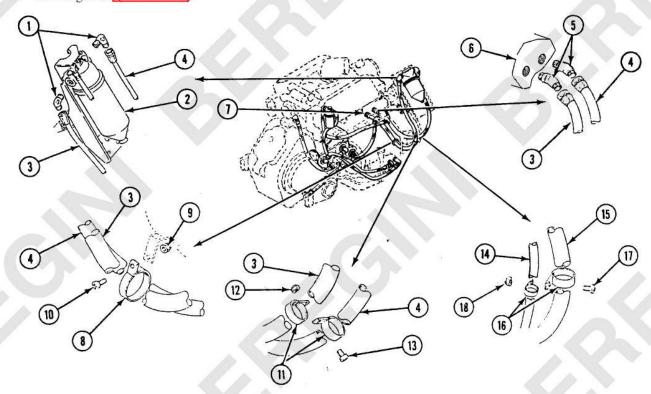
- Clean outside threads of tapered and straight pipe fittings with cleaning compound.
- 2. Put sealing compound on outside threads of tapered pipe fittings.
- 3. Put light coat of antiseize compound on outside threads of straight pipe fittings.

INSTALLATION

- 1. Install two elbows (1) on engine oil filter (2). Connect oil filter hose (3) and oil filter hose (4) to elbows.
- 2. Install two elbows (5) on engine block (6). Connect oil filter hose (3) and oil filter hose (4) to elbows.
- 3. Secure oil filter hoses (3 and 4) to power plant (7) with clamp (8), nut (9), and screw (10).



- 4. Secure hoses (3 and 4) to power plant (7) with two clamps (11), one nut (12), and screw (13).
- 5. Secure AOAP hose (14) to outlet hose (15) with two clamps (16), screws (17), and new lock nuts (18).
- 6. Add engine oi (WP 0128 00).



FOLLOW-THROUGH STEPS

- 1. Connect battery negative lead (WP 0292 00).
- 2. Start engine (see your -10).
- 3. Check engine oil filter hoses for leaks.
- 4. Stop engine (see your -10).
- 5. Install hull bottom access cover (WP 0383 00).
- 6. Install power plant rear access door (see your -10).



Military Manuals Com 20-1

REPLACE ENGINE OIL FILTER ELEMENT HOSES AND FITTINGS (M548A3)

0142 00

THIS WORK PACKAGE COVERS:

Removal (page 0142 00-2). Installation (page 0142 00-3).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Antiseize compound (WP 0542 00, Item 6) Sealing Compound (WP 0542 00, Item 37)

Suitable container

Strap (2)

Personnel Required

Unit Mechanic

References

See your -10

Standard Operating Procedures

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Both battery negative leads disconnected (WP 0292 00)

Center seat raised (see your -10)

Air cleaner assembly removed (WP 0159 00)

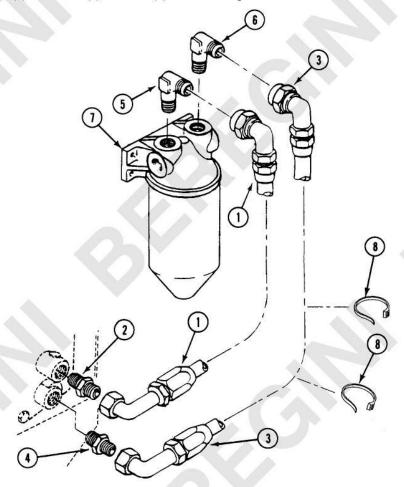
0142 00

REMOVAL

NOTE

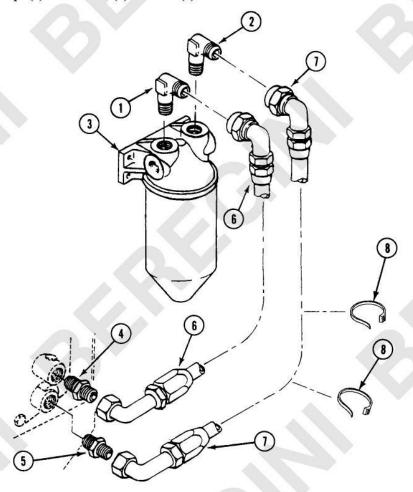
Dispose of engine oil in accordance with Standard Operating Procedures.

- 1. Place clean container of at least 1 quart (1 liter) capacity under engine oil cooler. Disconnect inlet hose (1) from adapter (2) and outlet hose (3) from adapter (4) on engine oil cooler.
- 2. Remove adapter (2) and adapter (4) from engine oil cooler.
- 3. Disconnect inlet hose (1) from elbow (5) and outlet hose (3) from elbow (6) on oil filter head (7).
- 4. Remove elbow (5) and elbow (6) from oil filter head (7).
- 5. Remove two straps (8) from hose (1) and hose (3). Discard straps.
- 6. Remove two straps (8) from hose (1) and hose (3). Discard straps.



INSTALLATION

- 1. Apply sealing compound to external tapered threads of elbow (1) and elbow (2) and install elbows in oil filter head (3).
- 2. Apply antiseize compound to external threads of adapter (4) and adapter (5) and install adapters in engine oil cooler.
- 3. Connect inlet hose (6) to elbow (1) and adapter (4).
- 4. Connect outlet hose (7) to elbow (2) and adapter (5).
- 5. Install two new straps (8) around hose (6) and hose (7).



FOLLOW-THROUGH STEPS

- 1. Connect both battery negative leads (WP 0292 00).
- Add oil if needed (WP 0128 00).
- 3. Install air cleaner assembly (WP 0159 00).
- 4. Lower center seat (see your -10).
- 5. Start engine and check engine oil filter hoses for leaks (see your -10).
- 6. Stop engine (see your -10).



REPLACE ENGINE OIL FILTER ELEMENT AND PARTS (M548A1)

0143 00

THIS WORK PACKAGE COVERS:

Removal (page 0143 00-2). Installation (page 0143 00-3).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Torque Wrench (WP 0541 00, Item 69)

Materials/Parts

Cleaning compound (WP 0542 00, Item 9) Sealing compound (WP 0542 00, Item 39)

Sealing compound primer (WP 0542 00, Item 40)

Engine oil (WP 0128 00)

Gasket Gasket

Preformed packing Suitable container Personnel Required

Unit Mechanic

References

See your -10

Standard Operating Procedures

Equipment Condition

Engine stopped (see your -10)

Battery negative lead(s) disconnected (WP 0292 00)

Power plant right rear access cover removed

(see your -10)

Top access cover and grilles removed (WP 0390 00).

0143 00

REMOVAL

1. Place suitable container under oil filter housing (1).

NOTE

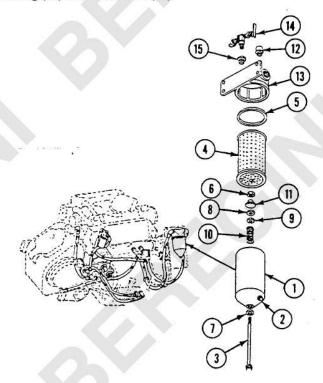
Dispose of engine oil in accordance with Standard Operating Procedures.

- 2. Remove drain plug (2) from oil filter housing (1) and drain oil.
- 3. Back out retaining bolt (3). Remove oil filter housing (1), oil filter element (4), and bolt as an assembly. Discard oil filter element and gasket (5).

NOTE

If only oil filter element is being replaced, go to Step 9.

- 4. Remove nut (6) from retaining bolt (3).
- 5. Remove retaining bolt (3) and gasket (7) from oil filter housing (1). Discard gasket.
- 6. Remove preformed packing (8) and retaining bolt (3). Discard preformed packing.
- 7. Remove washer (9), spring (10), and retainer (11) from retaining bolt (3).
- 8. If needed, remove plug (12) from filter head (13).
- 9. Remove valve (14) and bushing (15) from filter head (13).



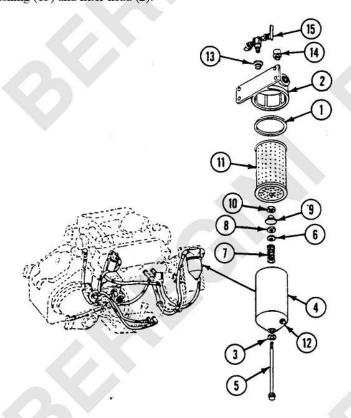
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INSTALLATION

NOTE

If only oil filter element is being replaced, do Step 1, Step 4, Step 5, Step 6, and Step 7, and follow-through Steps 1-3.

- 1. Apply a thin coat of engine oil on new gasket (1). Install gasket in filter head (2).
- 2. Install new gasket (3) on oil filter housing (4). Install retaining bolt (5) in housing.
- 3. Install washer (6), spring (7), new preformed packing (8), and retainer (9) on retaining bolt (5). Secure with nut (10).
- 4. Place new oil filter element (11) very carefully over retaining bolt (5) in housing (4).
- 5. Install oil filter housing (4) with new oil filter element (11) on filter head (2).
- 6. Install drain plug (12) in oil filter housing (4).
- 7. Tighten retaining bolt (5) to 50-60 lb-ft (68-81 N•m) torque.
- 8. Clean external threads of plug (14) and bushing (13) with cleaning compound.
- Apply a thin coat of sealing compound and sealing compound primer to cleaned external threads of plug (14) and bushing (13).
- 10. If removed, install plug (14) in filter head (2).
- 11. Install bushing (13) in filter head (2).
- 12. Install valve (15) in bushing (13) and filter head (2).



REPLACE ENGINE OIL FILTER ELEMENT AND PARTS (M548A1) — Continued

0143 00

13. Add engine oil (WP 0128 00).

FOLLOW-THROUGH STEPS

- 1. Connect battery negative lead(s) (WP 0292 00).
- 2. Start engine (see your -10). Check for oil leaks.
- 3. Stop engine (see your -10). Wait about 20 minutes for engine oil to drain back to pan, then check engine oil level. Add oil if needed (WP 0128 00).
- 4. Install power plant right rear access cover (see your -10).
- Install top access cover and grilles (WP 0390 00).

END OF TASK

REPLACE ENGINE OIL FILTER ELEMENT AND COVER (M548A3)

0144 00

THIS WORK PACKAGE COVERS:

Removal (page 0144 00-2). Installation (page 0144 00-3).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Cleaning compound (WP 0542 00, Item 9)

Gasket Gasket

Preformed packing Suitable container Personnel Required

Unit Mechanic

References

See your -10

Standard Operating Procedures

Equipment Condition

Engine stopped (see your -10) Carrier blocked (see your -10)

Both battery negative leads disconnected (WP 0292 00)

Center seat raised (see your -10)

REPLACE ENGINE OIL FILTER ELEMENT AND COVER (M548A3) — Continued

0144 00

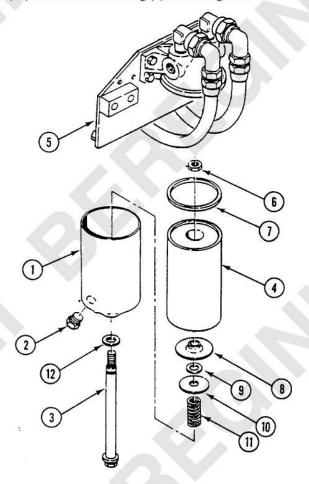
REMOVAL

1. Place clean container of at least 1 quart (1 liter) capacity under oil filter housing (1).

NOTE

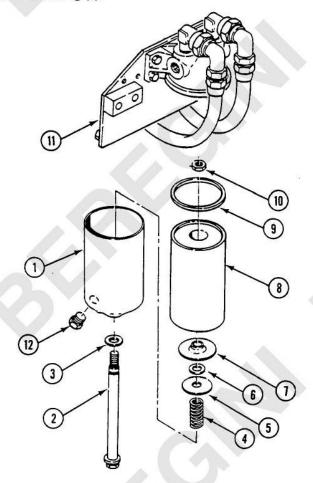
Dispose of engine oil in accordance with Standard Operating Procedures.

- 2. Remove drain plug (2) from oil filter housing (1) and drain oil.
- 3. Remove bolt (3) and oil filter housing (1) with oil filter element (4) from filter head (5).
- 4. Remove nut (6) and oil filter element (4) from bolt (3).
- 5. Remove oil filter element (4) and gasket (7) from oil filter housing (1). Discard element and gasket.
- 6. Remove packing retainer (8), spacer (9), preformed packing (10), and spring (11) from bolt (3). Discard preformed packing.
- 7. Remove bolt (3) and gasket (12) from oil filter housing (1). Discard gasket.



INSTALLATION

- Clean oil filter housing (1) with cleaning compound.
- 2. Install bolt (2) and new gasket (3) in oil filter housing (1).
- 3. Install spring (4), new preformed packing (5), spacer (6), and packing retainer (7) on bolt (2).
- 4. Install new oil filter element (8), new gasket (9), and nut (10) in oil filter housing (4).
- 5. Install oil filter housing (1) with new oil filter element (8) on filter head (11).
- 6. Install drain plug (12) in oil filter housing (1).



FOLLOW-THROUGH STEPS

- 1. Connect both battery negative leads (WP 0292 00).
- 2. Add oil if needed (WP 0128 00).
- 3. Lower center seat (see your -10).

END OF TASK



REPLACE ENGINE OIL FILTER ASSEMBLY (M548A1)

0145 00

THIS WORK PACKAGE COVERS:

Removal (page 0145 00-2). Installation (page 0145 00-3).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Cleaning compound (WP 0542 00, Item 9) Sealing compound (WP 0542 00, Item 39) Sealing compound primer (WP 0542 00, Item 40)

Engine oil (WP 0128 00)
Suitable container
Personnel Required

Unit Mechanic

References

See your -10

Standard Operating Procedures

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)
Battery negative lead disconnected (WP 0292 00)

Power plant right rear access cover removed

(see your -10)

Top access cover and grilles removed (WP 0390 00)

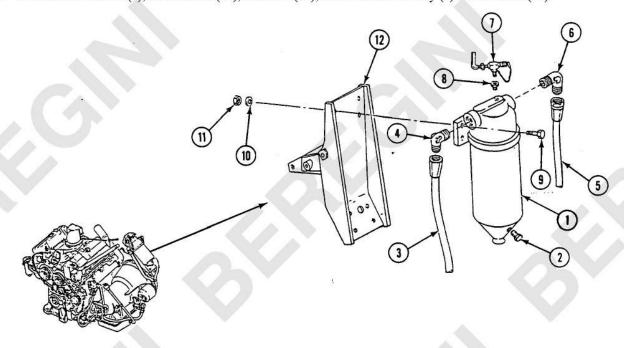
REMOVAL

- 1. Place suitable container under oil filter assembly (1).
- 2. Remove drain plug (2) from oil filter assembly (1). Allow engine oil to drain.

NOTE

Dispose of engine oil in accordance with Standard Operating Procedures.

- 3. Disconnect oil hose (3) and oil hose (5) from elbow (4) and elbow (6).
- 4. Remove elbows (4, 6) from oil filter assembly (1).
- 5. Remove sampling valve (7) and bushing (8) from oil filter assembly (1).
- 6. Remove four screws (9), two washers (10), four nuts (11), and oil filter assembly (1) from bracket (12).



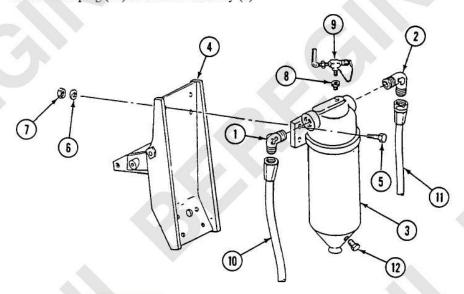
INSTALLATION

- 1. Clean external threads of elbow (1) and elbow (2) with cleaning compound.
- Apply a thin even coat of sealing compound primer and sealing compound to cleaned external threads of elbow (1) and elbow (2) before installation.

NOTE

Washers (6) are used on the two top screws only.

- 3. Install oil filter assembly (3) on bracket (4) with four screws (5), two washers (6), and four nuts (7).
- 4. Install bushing (8) and sampling valve (9) on oil filter assembly (3).
- 5. Install elbow (1) and elbow (2) on oil filter assembly (3).
- 6. Install oil hose (10) and oil hose (11) on elbow (1) and elbow (2).
- 7. Install drain plug (12) in oil filter assembly (3)



Add engine oi (WP 0128 00).

FOLLOW-THROUGH STEPS

- 1. Connect battery negative lead (WP 0292 00).
- 2. Start engine (see your -10).
- 3. Check filter assembly for leaks.
- 4. Stop engine (see your -10). Wait about 20 minutes for engine oil to drain back to pan. Then check oil level. Add oil if needed (WP 0128 00).
- 5. Install top access cover and grilles (WP 0390 00).
- Install power plant right rear access cover (see your -10).

END OF TASK



REPLACE ENGINE OIL FILTER ASSEMBLY (M548A3)

0146 00

THIS WORK PACKAGE COVERS:

Removal (page 0146 00-2). Installation (page 0146 00-3).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Sealing compound (WP 0542 00, Item 39)

Sealing compound primer (WP 0542 00, Item 40)

Lock nuts (4)

Suitable container Personnel Required

Unit Mechanic

References

See your -10

See your PMCS

Standard Operating Procedures

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Center seat raised (see your -10)

Both battery negative leads disconnected (WP 0292 00)

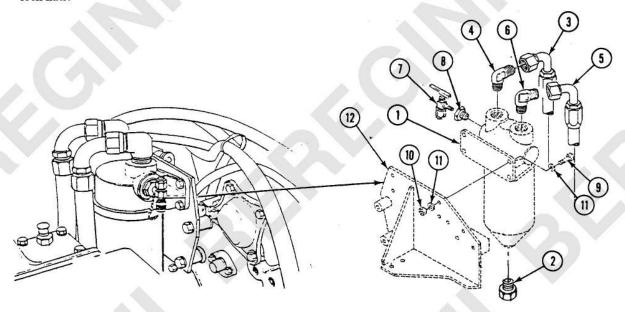
REMOVAL

1. Place a clean suitable container of at least 1 quart (1 liter) capacity under oil filter assembly (1).

NOTE

Dispose of engine oil in accordance with Standard Operating Procedures.

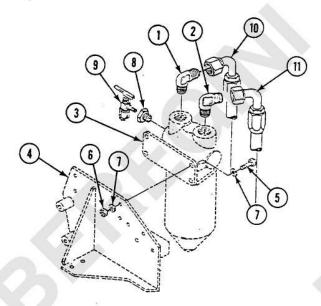
- 2. Remove drain plug (2) from oil filter assembly (1). And allow engine oil to drain from filter.
- 3. Disconnect inlet hose (3) from elbow (4).
- 4. Disconnect outlet hose (5) from elbow (6).
- 5. Remove elbows (4 and 6) from oil filter assembly (1).
- 6. Remove AOAP sampling valve (7) and bushing (8) from oil filter assembly (1).
- 7. Remove four screws (9), lock nuts (10), eight washers (11), and oil filter assembly (1) from bracket (12). Discard lock nuts.



0146 00

INSTALLATION

- 1. Apply sealing compound primer and a thin even coat of sealing compound to cleaned external threads of elbow (1) and elbow (2) before installing.
- 2. Install oil filter assembly (3) on bracket (4) with four screws (5), new lock nuts (6), and eight washers (7).
- 3. Install bushing (8) and AOAP sampling valve (9) on oil filter assembly (3).
- 4. Install elbow (1) and elbow (2) on oil filter assembly (3).
- 5. Connect oil inlet hose (10) to elbow (1).
- 6. Connect oil outlet hose (11) on elbow (2).
- 7. Start engine (see your -10). Check oil filter assembly (3) for leaks.



 Stop engine (see your -10). Wait about 20 minutes for oil to drain back to pan. Then check oil level. Add oil if needed (WP 0128 00).

FOLLOW-THROUGH STEPS

- 1. Connect both battery negative leads (WP 0292 00).
- 2. Lower center seat (see your -10)

END OF TASK



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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4. To: (Forward to proponent of publication or form) (Include ZIP Code)						Use Part II (reverse) for Repair Parts and Special Tools Lists (RPSTL) and Supply Catalogs/Supply Manuals SC/SM).			
TO: (Forward to pro	oponent of publi	cation or form,) (Include ZIP	'Code)			FROM: (A	ctivity and location) (ir	nclude ZIP code)
	PARTI – A	LL PUBLI	CATIONS	(EXCEF	T RP	STL AND	SC/SM) AI	ND BLANK FORMS	s
PUBLICATION/FOR	RM NUMBER 0-247-20-1		5		DATE	30 Ju	ine 2001	Cargo Tracked, 6-	Manual for Carrier, Ton M548A1 and
ITEM	PAGE	PARA	LINE	FIGU		TABLE	RECOM	M548A3 MENDED CHANGES	S AND REASON
		*Referen	ce to line nu	ımbers w	ithin th	e paragran	h or subpara	agraph.	
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A.		PA	RT II – REPAIR PARTS	AND SPECIAL TO	OOL LISTS A	ND SUP	PLY CATALOGS/S	SUPPLY MANUA	LS
PUBLIC	ATION NU			DATE 30 June	2001		TITLE Unit Maintenance Manual for Carrier, Cargo Tracked, 6- Ton M548A1 and M548A3		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED		MENDED ACTION
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THE METRIC SYSTEM AND EQUIVALENTS Military Manuals. Com

LINEAR MEASURE

- $1 \ Centimeter = 10 \ Millimeters = 0.01 \ Meters = 0.3937 \ Inches$
- 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
- 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

- 1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
- 1 Kilogram = 1000 Grams = 2.2 Lb.
- 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

- 1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
- 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

TO CHANGE	то	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Millimeters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour.	Kilometers per Hour	1.609
TO CHANGE	то	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
	IVIIIC5	
Square Centimeters		
Square Centimeters	Square Inches	0.155
	Square Inches	0.155
Square Centimeters	Square Inches Square Feet Square Yards	
Square Centimeters	Square Inches	
Square Centimeters	Square Inches	
Square Centimeters	Square Inches	0.155 10.764 1.196 0.386 2.471 35.315
Square Centimeters	Square Inches	0.155 10.764 1.196 0.386 2.471 35.315 1.308
Square Centimeters	Square Inches	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034
Square Centimeters	Square Inches	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113
Square Centimeters Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Milliliters Liters	Square Inches	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113 1.057
Square Centimeters Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Milliliters Liters Liters	Square Inches	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113 1.057 0.264
Square Centimeters Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Milliliters Liters Liters Liters Liters	Square Inches Square Feet Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts Gallons Ounces	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113 1.057 0.264 0.035
Square Centimeters Square Meters Square Meters Square Meters Square Kilometers Cubic Meters Cubic Meters Milliliters Liters Liters Liters Liters Grams	Square Inches Square Feet Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts Gallons Ounces Pounds	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113 1.057 0.264 0.035 2.205
Square Centimeters Square Meters Square Meters Square Meters Square Kilometers Cubic Meters Cubic Meters Milliliters Liters Liters Liters Liters Liters Kilograms	Square Inches Square Feet Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts Gallons Ounces Pounds Short Tons	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113 1.057 0.264 0.035 2.205
Square Centimeters. Square Meters. Square Meters. Square Meters. Square Kilometers. Cubic Meters. Cubic Meters Milliliters. Liters. Liters. Liters Grams Kilograms Metric Tons Newton-Meters.	Square Inches. Square Feet Square Yards Square Miles Acres. Cubic Feet Cubic Yards Fluid Ounces Pints. Quarts Gallons Ounces Pounds Short Tons Pound-Feet	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113 1.057 0.264 0.035 2.205 1.102 0.738
Square Centimeters Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Milliliters Liters Liters Liters Liters Kilograms Kilograms Metric Tons	Square Inches Square Feet Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts Gallons Ounces Pounds Short Tons Pound-Feet Pounds per Square Inc	0.155 10.764 1.196 0.386 2.471 35.315 1.308 0.034 2.113 1.057 0.264 0.035 2.205 1.102 0.738 h 0.145

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches

1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet

1 Sq. Kilometer = 1,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu.Feet

TEMPERATURE

5/9 (°F - 32) = °C

212° Fahrenheit is equivalent to 100° Celsius 90°Fahrenheit is equivalent to 32.2° Celsius 32° Fahrenheit is equivalent to 0° Celsius

 $(9/5 \times ^{\circ}C) + 32 = ^{\circ}F$



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